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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Some Recent Arbitration Awards and the Labor Market

THE bull stock market now in progress in the financial district gives the impression to some of another coming era of prosperity, inflation and high wages. Undoubtedly, the United States is in good commercial condition. But it should be remembered that call money and interest rates for short periods are at a very low figure, the lowest for a long time. This always has a stimulating effect on the market for securities, particularly bonds. Low money rates are also usually an indication that there is not a great call for capital by new enterprises or extensions of old ones. On the whole, then, high prices for securities are not a sure sign of that industrial activity which is usually considered the synonym in business of good times.

Electric railways are particularly interested in the situation because of its effect on the flotation of new securities and on the labor market. So far as flotations are concerned, this is undoubtedly a good time to market sound securities, and electric railway issues are coming to be considered by the investing public as being in this category.

In regard to the labor market, cheap money should eventually stimulate business and industrial activities and thus finally put up wages if no other conditions arise to intervene. Wages in the electric railway industry, however, do not move in such close parallel to the general labor market as in many other lines of business, and to some extent less even than formerly in the electric railway industry. The reason for this is partly that there is a lower turnover on nearly every property, so that wages are in somewhat less sympathetic touch with those of the general labor market either to go up or down, and partly because of the growing tendency to settle labor disputes by arbitration rather than by strikes.

A. S. Richey's June figure for street railway wages, published in the issue of this paper for June 28, shows that electric railway wages are now 120 per cent above the 1913 figure and within 12 points of the highest figure ever reached, namely, in September, 1920, when the wages index, as compared with 1913 at 100, was 232. In fact, there has been a constant increase in electric railway wages since April, 1923, as shown by the following statement, all figures being based on 1913 at 100: April, 207; May, 208; June, 210; July 212; August, 214; September, 215; October to December, 218; January to May, 219; June, 220.

Incidentally it should also be said that all of these figures are far in excess of those reached during the war. The armistice was signed Nov. 11, 1918, and at that time the electric railway wages index was the highest then reached, namely, 154, as compared with 1913. The present figure is more than 50 per cent higher than this figure of November, 1918.

The situation is one which demands attention by all electric railway companies. Are some recent arbitration decisions increasing railway wages to a greater extent than is warranted, and will not fares have to be raised if this constant upper trend continues?

Illinois Commission Takes a Broader View

A CHANGE of attitude on the part of the Illinois Commerce Commission from its previous position of antagonism to the Chicago Surface Lines is shown in two recent orders affecting that property. Both of these are distinctly for the benefit of the car riders of Chicago, one of them calling for extensions of track and the other for a rerouting of the cars in the downtown district.

Wartime conditions and other obstacles have prevented the railway from carrying out the provision of the ordinance under which it operates that calls for a regular extension program of track extension at the rate of some 23 miles per year. Under the present city administration, which has been constructive in its policies, a compromise program has been arrived at and placed before the commission for its approval. This program required modification of a previous order which authorized the constituent companies to draw from their reserve certain amounts for the addition of new cars to the system. Now the commission has extended the permission to allow part of such reserves to be used for track extensions. Further, it has taken a strong stand that the companies should not be required to construct tracks until the city has made provision for the paving of the streets on which they are to be built.

In this connection the order says:

"It is pertinent to point out that the practice of requiring a street railway to be laid in an unimproved street which involves the subsequent removal of the tracks and destruction of the roadbed to permit sewers, water mains and service pipes to be laid is uneconomical and imposes an unreasonable burden and hardship upon the street car riders."

The commission also disapproves of the previous requirement that the companies pave their rights-of-way while the rest of the street is unpaved. "It is obvious," states the decision, "that this is calculated to interfere with safe and efficient street railway operation and detrimental to the traveling public."

This new viewpoint of the Illinois Commerce Commission represents a standard of sane regulatory methods which may well be followed in the rulings of other commissions. If it continues it means much to the investors in utilities and in the end will be helpful also to the patrons.

Should the Railways Run the Taxicabs?

A STRONG argument in favor of the supply by electric railway companies of all of the kinds of transportation needed in the city is made in this week's issue by George H. Davis of Ford, Bacon & Davis, Inc. Mr. Davis approaches the situation from somewhat a new angle in that he estimates the number of vehicles required in cities of more than 100,000 population to give the public the transportation service which it needs. In general, his estimate of the number of passenger electric railway cars does not differ greatly from those at present. His figure, exclusive of rapid transit lines, is 30,000 44-passenger double-truck motor cars with trailers, but he would increase considerably the carrying capacity of the buses used in city service, and he believes the railway company should control them and also the taxicabs in the city. The purpose of this would be to eliminate duplication—sometimes triplication—of existing service.

All may not agree with Mr. Davis's total figures or with the division which he proposes for the different means of transportation, or with the types and capacities of vehicles suggested. The suggestion that railway companies should engage in taxicab service will also provoke comment, as this individual service seems a little far afield from that supplied by the average electric railway. There is no doubt, however, that the taxicab is a favorite form of public transportation and that by the application of scientific principles of routing, in co-ordination with other means of transit, much of the present taxicab dead mileage could be eliminated. In other words, if the principles of co-ordination of all means are to be followed to their logical conclusion, there are arguments in favor of the operation of taxicabs by the organization that runs the cars and buses.

Decision to Abandon Synchronized Traffic Control Not Based on Its Shortcomings

THERE has been so much muddling in the matter of traffic control, so much talk about the complexity of the problem and so little energetic action to solve it that it was refreshing to see Gen. Smedley Butler, Director of Public Safety in Philadelphia, attack the subject forcefully and put into effect a new method of regulation. Although General Butler's plan was similar in some respects to the synchronized traffic control systems found elsewhere, several novel features contributed materially to its successful operation.

Probably the most important difference between General Butler's plan and those tried in other cities was that the signal lights were used primarily for the information of the traffic policemen and were not intended directly to control the actions of the drivers of vehicles. On that account his system had a flexibility far greater than that of electrically interlocked signals at individual street intersections. At the same time it accomplished to a considerable extent the synchronization of the signals of the various traffic officers. Even a skeptic, distrusting all schemes for regulating traffic by colored lights must have been impressed by watching how it worked on the street.

After several weeks' trial, during which it appeared to meet with the almost universal approval of the traveling public, both automobilists and street car riders, the plan has had to be abandoned because the City Council refused, apparently for political reasons, to appropriate money for the installation of necessary equipment. That such was the reason for the refusal is indicated by the fact that the Council on the same day when it declined to appropriate the funds necessary to carry out the plan of the Director of Public Safety appropriated an equal amount of money for the purchase and installation of more old-fashioned signals.

However, General Butler should feel well satisfied with the results of this experiment. Philadelphia may not desire to avail itself of an improvement in traffic control methods, but other cities that have had a chance to see the plan in operation may well give it a trial.

Trying to Raise Himself by His Bootstraps

A POINT of view at variance with that of using technically trained men for motor testing work in a railway shop, as set forth in a recent editorial in this paper, was taken in a letter to the editors published in the July 5 issue of ELECTRIC RAILWAY JOURNAL. The correspondent believes that a more satisfactory plan would be for the railway men now supervising the various departments to secure the services of boys or young men and give them several years practical training in the shops.

It may well be doubted, however, if this plan would be any better than, or indeed as good as, the plan of employing graduate electrical engineers. Not all such engineers would stick to the railway business and make a success of it; neither would all of the boys picked by the superintendent and trained in the shop exclusively. Experience shows that the knowledge that has been gained through consistent study places the college men above their competitors in those phases of the work that demand the use of engineering principles. The fact that the two classes of men are more or less in competition, however, emphasizes the failures of college men which do occur and gives the impression that they are rather numerous.

One of the largest electric railways in this country has for years made a practice of securing the services of engineers just out of college. They are put through a two-year training course to familiarize them with the various departments of the railway. At the end of that time they are given permanent positions where the course of training has fitted them to do the work. Only a small proportion of the men who begin this training course go through with it and take permanent positions with the company. Others find that their inclinations do not lie in the line of railway work or that more attractive opportunities exist elsewhere. But the company is satisfied to undertake the training of all these men for the sake of those who remain.

Aside from the question of whether more college men or non-college men are likely to stick at the railway game, there is another serious objection to the plan advocated by the correspondent. It might be possible to train the boys to do as good work as their teachers, but there would be little reason to expect them to do any better. Instead of having new men enter the organization, bringing with them new ideas, he would have the old ideas passed on from generation to generation. So far as improving the quality of the work and modernizing methods in the railway shop goes, this procedure would resemble that of a man trying to raise himself by his bootstraps.

Changing Tunnel for Rapid Transit

In 50 Hours with 1,526 Men the Boston Elevated Railway and the Boston Transit Department Converted the East Boston Tunnel from Surface Car Operation with Overhead Trolley to Third Rail Rapid Transit Train Operation—A New Station Was Built at Maverick Square

Two-Car Units of Type Used in East Boston Tunnel

ONLY a short time ago the local newspapers of Boston carried items announcing that the Boston Elevated Railway had changed its operation in the East Boston tunnel from surface trolley cars to third-rail rapid transit trains. This information was also published in the news columns of ELECTRIC RAILWAY JOURNAL, issue of April 26, page 671. Behind these bare statements of fact was hidden a story of engineering and construction achievement, a story of railroading, of interest to every railroad man.

On Friday evening, April 18, when the last scheduled trolley car entered the East Boston tunnel, it made its routine trip in the usual way. No ceremonies marked its entrance but feverish construction activity followed the completion of its trip. No formal speeches marked its exit but the curt, forceful language of engineers, superintendents and foremen followed in its trail. It was the last surface passenger car to travel through this twenty-year old hole under Boston harbor.

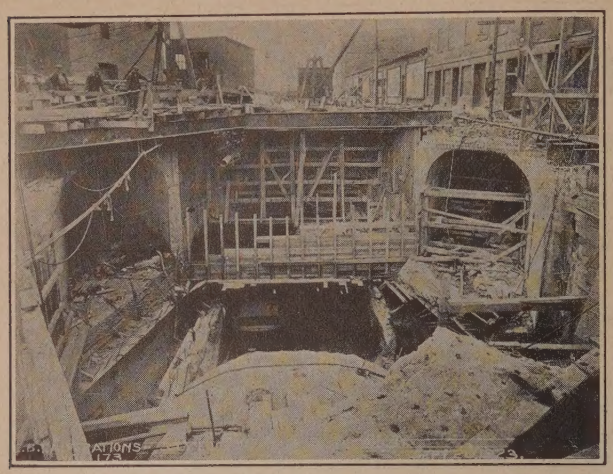
For two decades, trolley cars operated through this tunnel had met the transportation requirements. To be sure they had been crowded in up to the maximum frequency possible with a modern block signal system. And then they had been coupled together in two and three-car units, so heavy had the traffic become. But at last the fact had to be faced that this service was inadequate. Rapid-transit operation, with high-speed, multiple-unit trains of greater length had to be introduced.

To make the change involved the construction of a terminal station at the East Boston end of the tunnel. Formerly no station had been needed as the surface cars simply ran up the grade out of the tunnel onto the city streets at Maverick Square, the tunnel portal. But rapid transit trains must be kept off the streets—hence it became necessary to build a terminal under and around the existing tunnel portal, without interrupting the operation of the cars.

The East Boston tunnel, like other subway and tunnel facilities in the city of Boston, is the property of the city and is leased to and operated by the Boston Elevated Railway. All construction and reconstruction work on such tunnels is handled by a public commission, the Transit Department of the City of Boston.

Reconstruction work was commenced in the fall of 1921. An interesting feature of the undertaking was the employment of needy ex-soldiers on the work. At that time the unemployment situation throughout New England had reached alarming figures and a large proportion of the unemployed were veterans of the World War. With a view to reducing the constantly increasing payroll for soldiers' relief, Mayor Curley issued instructions to have this work done by day labor, preference to be given to former service men. Although many of these men were inexperienced in work of this character, they soon acquired the necessary knowledge under skillful supervision, and this massive structure was completed within the time limit, despite unforeseen construction difficulties and the abnormal weather conditions. Day and night for over two years, crews of men were engaged in excavating below tide water, removing and relocating water, sewer and gas pipes, telephone and telegraph conduits and electric lighting service without even momentary interruption. Night cars operated regularly regardless of the fact that more than 15,000 charges of dynamite were shot off for blasting sections of the old concrete tunnel which had to be removed.

About 125,000 cu.yd. of material had to be excavated, a great proportion being removed from under large buildings which had to be carefully underpinned; 28,000 cu.yd. of reinforced concrete was installed requiring



Cross-Section of Tunnel During Reconstruction at East Boston End

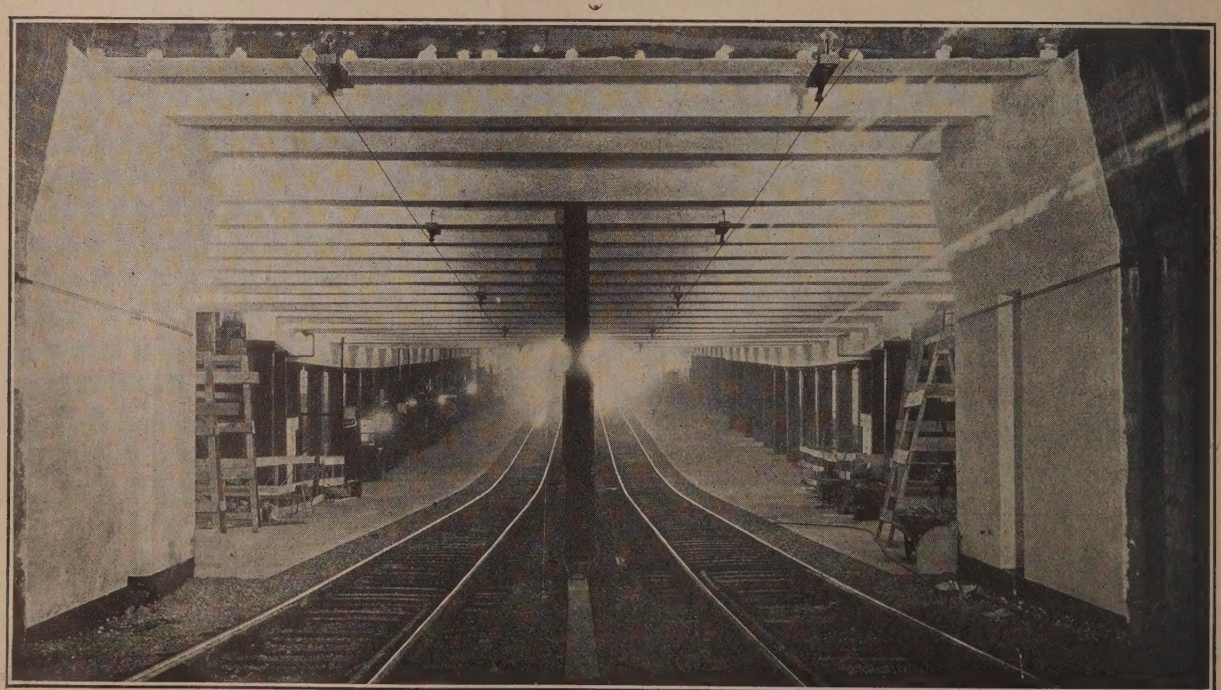
42,000 bbl. of cement, and more than 1,000 tons of steel reinforcing rods; 1,800 tons of heavy steel for girders and columns were fabricated and erected and 130,000 ft. of saturated fabric for waterproofing the structure was laid. Included in this underground structure is a completely equipped car shop, fitted with all the necessary tools and appliances for making repairs to the cars.

As the Maverick Square terminal station neared completion the problem of making the change-over from trolley car operation to third-rail trains had to be solved by officials of the railway. This involved the raising of all station platform levels to a height of 3 ft. 6 in., or on a level with the floors of the new subway cars. It involved the installation of third-rail construction for double tracks, the entire length of the tunnel. It involved the removal of old guard rail, and the placing of new. It involved the installation of an entirely new block signal system with automatic emergency stop devices. All special work had to be replaced to accommodate M.C.B. flanges. And the whole job had to be done in the shortest possible time, as this tube provided the only convenient means of transportation to thousands of suburbanites in their daily travel to and from the business section of Boston. To interrupt this traffic even for a day would have involved serious consequences. Ordinarily a week's work would have been required to do this job. But a week simply could not be spared. Accordingly a most carefully laid out and elaborate plan was devised by General Manager Edward Dana, Harry M. Steward, superintendent of maintenance and other officials, in collaboration with the Boston Transit Department.

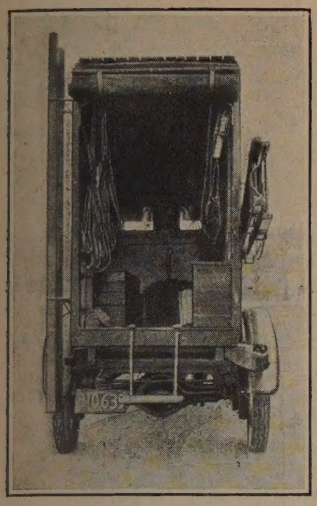
Saturday, April 19, was a legal holiday, Patriots' Hill Day, in Massachusetts. The plan involved suspending operation of the tunnel by trolley cars at 8:30 p.m. Friday, April 18, and resuming operation with third rail trains Monday morning the 21st. And incredible though it may seem this plan went through on schedule, with a few hours to spare.

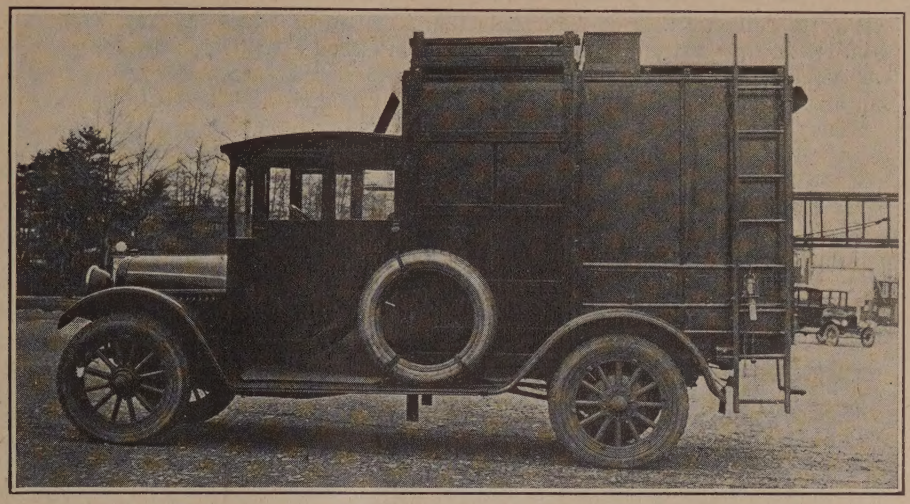
As that last trolley car made its way through the tunnel, Friday night, it was followed by construction cars, loaded with men, tools, equipment and material. Inside of fifteen minutes the tunnel became a hive of activity, apparently confused, in reality so well ordered and supervised that about 50 hours of stupendous effort wrought the entire change without a hitch. Gangs at each of the four stations en route threw up temporary wooden platforms to the new level. Other gangs set to work with acetylene torches cutting up and removing the old Z-bar guard rail—20,000 ft. of it in 23 hours. Rail cars followed and picked up the pieces. Third-rail insulators had been placed in advance with third rail laid alongside and bolted up. Now it was picked up and laid in place on the insulators. Special work to the extent of 340 ft. was cut up and removed, and 724 ft. of new special work was installed. Elsewhere, signal crews were at work on the new installation.

In all a total of 1,525 men were employed, with a maximum of 780 on one shift, all in a tunnel 1.7 miles



Where Surface Cars Enter Maverick Square Station—Rapid Transit Tracks Are Parallel and Outside Columns





Emergency Tower Truck of Middlesex & Boston Street Railway

As shown at the left, the interior of the body provides a warm and comfortable place for linemen to ride. Note the portable light hanging on the right-hand side. The inclosed cab which is shown in the view at the right protects the driver from inclement weather. Communication with men working on the tower is provided by an opening in the roof.

long. Twelve-hour shifts were worked; 2,185 meals were served to the men while on the job. Only two trifling personal accidents were reported during the whole period.

At 1 a.m. Monday morning Mr. Steward told the operating department they could have the tunnel. Power was turned on the third rail, the motorman of a waiting train turned on his controller and the first rapid transit train rolled down through the hole. Others followed, as the transportation and equipment executives hastened to break in their men during the two or three short hours left before the rush of Monday morning commuters was upon them.

The new cars used in the tunnel are unique in that they are always operated in units of two, or multiples of two, with control equipment on one end only of each car. They were built by the Pullman Company and are each equipped with four Westinghouse 514-E motors with Westinghouse electro-pneumatic variable load brakes. Other details of their construction and equipment were described in the ELECTRIC RAILWAY JOURNAL for Jan. 12, 1924.

The personnel of the Boston Transit Department which handled the engineering and construction of the Maverick Square station consists of Colonel Thomas F. Sullivan, chairman, formerly well known as a street railway man and later Commissioner of Public Works, city of Boston; Louis A. Rourke, formerly a division engineer on the Panama Canal and later Commissioner of Public Works, city of Boston; and Francis E. Slattery, a Boston lawyer. Ernest R. Springer is chief engineer.

An unusual degree of co-operation existed throughout the work between the Transit Department and the Boston Elevated Railway. A further remarkable degree of co-operation was enjoyed from the 1,500 men who labored day and night through a public holiday and Sunday to accomplish this remarkable achievement. Their pride was aroused to win and they did.

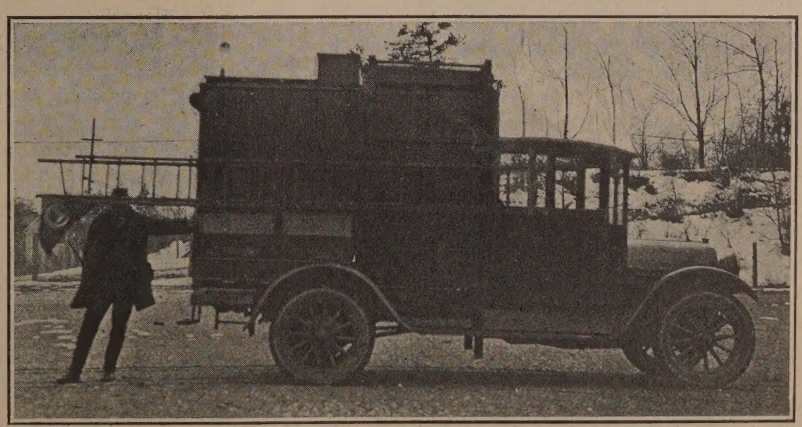
Tower Wagon for Line Repair Has Inclosed Body

Truck Used by the Middlesex & Boston Street Railway for Emergency and Light Overhead Construction Work Embodies Several Novel Features

MAKING repairs to overhead wires is a cold job in New England in winter. Not the least disagreeable feature of this work is the trip to the place where repairs are to be made. With this in mind the Middlesex & Boston Street Railway, Newtonville, Mass., recently purchased a Reo speed wagon chassis and built for it a special inclosed body, with a closed cab for the driver.

This company operates more than 100 miles of route, of which about 68 per cent is single track. As this is protected by signals and equipped with electric track switches and a private telephone dispatching system there is frequent need for a light emergency line wagon. The truck is operated by a crew of three men, all of whom have licenses to drive. One is a first-class signal, telephone and electric switchman. Another is a first-class lineman, and the third is an all-around helper.

The body was built in the Waltham shops of the rail-



An Emergency Wagon with Inclosed Body Built by the Middlesex & Boston Street Railway. Tool Boxes May Be Opened from Either the Inside or the Outside

way. Its framework is of oak, while the sides are of ⅞-in. North Carolina pine. Over this has been placed a canvas cover which is painted bright red. The closed cab and closed body on this truck provide a warm and comfortable place for the men to ride to work and protect the tools and equipment from the weather.

Materials used in making line repairs are kept in boxes inside of the truck body. Easy access to these boxes is provided by several openings, one on the inside and another on the outside so that the men can reach materials from the street. A portable light to be connected to the trolley wire hangs inside of the truck. This is of 56-watt size and has 25 ft. of cord with an automatic retriever for taking up the slack.

A tower which rises to a height of 14½ ft. above the ground slides on a trackwork of channel irons. Workmen reach the platform by a stationary ladder on one side of the body. An opening with a hinged cover in the roof of the driver's cab makes it possible for the men on the tower to communicate easily with the driver. On the roof of the body is a box in which the heavy tools used for tower work are kept. An extension ladder for use in locations where the tower cannot be used is hung from iron hooks on the outside of the body. The rear step is hinged so that it may be thrown back into the body when desired.

The chassis cost $1,450 and the body slightly less than $400, making a total cost for the vehicle of approximately $1,850. Experience with the operation of this truck for a few months' time indicates that it costs approximately 5 cents per mile to operate without including depreciation or insurance.

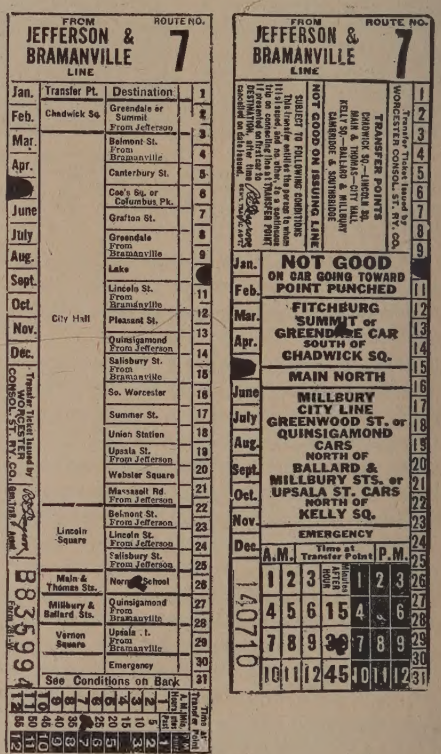
Simplified Transfer in Worcester

New Transfer Is Punched to Indicate Lines on Which It Is Not Acceptable—This Permits Grouping of Routes and Gives More Space for Other Features

INDICATION of the routes on which it is not good, instead of showing destination and transfer point, is the feature of a new form of transfer introduced by the Worcester Consolidated Street Railway, Worcester, Mass.. The point where the passenger boards the car determines the extent of the transfer privilege, hence the plan has been termed a "boarding-point" transfer system. While designed to prevent doubling back, the new type of transfer gives the passenger a greater degree of flexibility than the former one in that it does not restrict him to a particular line in order to reach his destination.

As may be seen from the accompanying illustration, the new transfer, like the old one, is a route transfer. However, instead of listing separately all the six transfer points and the 23 possible destinations for the line shown, the routes on which the transfer is not good are combined into three groups. This has made it possible to use much larger type and still keep the space for the route limitations down to half what it was on the old transfer. Part of the space gained has been used to print the conditions under which the transfer is issued, which formerly were on the reverse side. The space for time limit has been nearly doubled, and with a change from a 5-minute limit to a 15-minute limit, much larger type is used for the hours. Even with these changes the over-all size has been decreased from 2x7 in. to 2x6½ in. The space on the reverse side is used for printing the restrictions on issue and acceptance.

The routes on the system have been arranged in seven groups, for each of which a distinctive color of transfer has been adopted. This aids the conductor to determine the validity of a proffered transfer. The prepayment system is used and transfers are issued at the time of paying fare. In case there is a limitation of routes, which is determined largely by the point where the passenger boards the car, the conductor punches the proper block on the transfer. While the old form always required punching to indicate destination,



Left—The Old Form of Transfer Used by the Worcester Consolidated Street Railway. Right—The New Transfer, Which Is Punched to Indicate Where It Cannot Be Used

the new form may be issued with only date and time indicated.

In addition to the various route transfers, a universal transfer has been provided. This lists the restrictions of all the route transfers. It is for use on special routes or when the regular supply of transfers is exhausted.

Should a passenger request a transfer to a line to which one could not be given the conductor would direct him as to how to reach his destination. Instructions governing such special cases are printed on the back of the transfer.

Since month and date are canceled at the office, the conductor has only to punch the time of arrival at the transfer point and, if needed, the line limit.

The new system applies to all of the 21 city routes and four in the county. On 12 of the city routes no restrictions govern transfers; the holder may ride anywhere on the system excepting back on the same line, hence only the time limit needs to be punched by the conductor. Retransfer privileges are not granted.

Bus Operating Results in Providence, R. I.

Total Figures for 1923 Show Only One Line of the Seven Made a Profit, Although Others Substituted for Rail Lines Show Less Loss than Rail Operation—Last Year the Company Ran Nearly 850,000 Bus-Miles with $200,000 Revenue

THE United Electric Railways of Providence, R. I., was among the early companies to take up the operation of buses in co-ordination with railway service. It has therefore had an opportunity to find out operating costs and revenue possibilities in various kinds of service, such as but few companies have as yet experienced. These figures are presented in detail herewith. They show an average revenue for all lines of 23.40 cents, an average operating cost of 26.01 cents and an average operating ratio of 110.16 per cent.

Only the bus operation on Broadway, where the buses handle the local service and street cars run express on the same street, is showing a profit, although the operation of some of the other lines, where buses have been substituted for rail service, may be said to show a profit in the sense that it is causing the company less loss in providing a necessary service.

This bus operation on Broadway was treated at length in an article in ELECTRIC RAILWAY JOURNAL for March 15, 1924, page 411. The various types of bus service in which the company has engaged may be briefly summarized as follows:

1. Olneyville-Eddy Street. This is a crosstown service which intersects eight rail lines, terminating at two of them. The line is 2.83 miles long. Two buses are operated in off-peak service and four during the rush hours. The corresponding headways are 30 minutes and 10 minutes.

2. Pawtuxet-Lakewood. This is a substitution of buses for a car line. The buses feed into the Broad Street car line. It represents a very large saving over the former operation of cars. The company was faced with renewing the tracks and substituted buses instead. The length of line is 1.16 miles and it is operated with one bus on a 30-minute headway.

Bus Routes Within Providence, Operated by the United Electric Railways. The Outlying Routes Are Shown in the Second Map

3. Pawtuxet-Warwick Downs. This is a wishbone line with the Pawtuxet-Lakewood. The buses make one trip to Pawtuxet and the next one to Lakewood. This service to Lakewood is provided only in the summer time except for a tripper for school children in winter. The length of route from Pawtuxet to Warwick Downs is 1.29 miles and that to Lakewood 1.16 miles, as noted above. This line is in the nature of an extension of the rail lines and a feeder to it. It handles largely summer business. It is operated with one bus on a 30-minute headway.

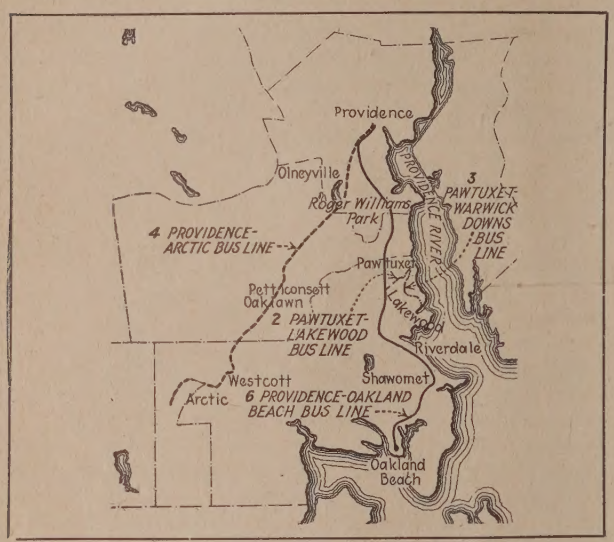
4. Providence-Arctic. This is an intercity bus line extending from the business district in Providence, 11.26 miles, to Arctic. Three buses on a 30-minute headway are used in off-peak service and eight buses on a 10-minute headway in the rush hours.

5. Providence-Broadway. This is tied up with the street car service on Broadway, the cars operating express and buses providing the local service. The length of the bus run is 1.35 miles. Five buses on a 5-minute headway are operated in off-peak hours and ten buses

on a 2½-minute headway during rush hours. The headway of street cars is 5 minutes.

6. Providence-Oakland Beach. This is an intercity line 11.62 miles in length with buses operated from the business district in Providence to the center of Oakland Beach. Two buses are operated normally on a 60-minute headway, with four in the heavy hours on a 30-minute headway.

7. Roger Williams Park. The service on this line has been abandoned, but it is included here because the operating figures for 1923 include the operations on this line. It was a park route 3.8 miles long which was essentially a pleasure ride and intended for operation during Sundays of July and August. The operation was started at the request of one of the park commissioners, anticipating that a large number of



In This Smaller Map the Outlying Bus Routes Operated by the United Electric Railways Are Shown

people would avail themselves of this service. The results were disappointing as indicated in the statement of earnings in an accompanying table.

Up to the end of December, 1923, the company had 31 buses to supply the schedules noted above.

Detailed Statement of Earnings and Expenses Explained

The accompanying table of earnings and expenses for all bus operations of the Providence company for the year 1923 shows the full detail accounting followed by this company. The following comments tie in with this table by account numbers and are given to answer questions that naturally arise in one's mind upon examining this table.

12-A. The expenditure for removal of snow and ice was very low in 1923 and the company expects that this will be higher in the future. This expense will average about $3,500 in the city. The company operates over 21 miles of route on which the state will take care of the cost of snow removal..

24-A. The expense for buildings, fixtures and grounds set up in this table is a prorated amount of railway buildings, but it will be more in the future as the bus department now has a building of its own.

36-A. The item entered as garage equipment is really repairs to garage equipment.

40-A. Depreciation of buses is figured on a five-year basis, or approximately 200,000 miles.

INCOME STATEMENT FOR BUS OPERATIONS, COVERING THE TWELVE-MONTH PERIOD ENDED DEC. 31, 1923, UNITED ELECTRIC RAILWAYS COMPANY, PROVIDENCE, R. I.

		12 Mos. Ended Dec. 31, 1923	Per Bus-Mile, 12 Mos. Ended Dec. 31, 1923 Cents
	Operating Revenues:		
101-A	Passenger revenue, bus operation	$198,277.49	23.39
110-A	Station and car privileges (advertising)	1,050.06	0.12
116-A	Rent of bus equipment	4.00	.....
	Total revenue from transportation	$199,331.55	23.51
	Operating Expenses:		
12-A	Removal of snow and ice	$30.19	.....
24-A	Buildings, fixtures and grounds	879.86	0.10
	Total way and structures	$910.05	0.10
29-A	Superintendent bus equipment	$4,550.09	0.54
36-A	Garage equipment	21.21	.....
37-A	Shop expenses, bus department	1,164.24	0.13
38-A	Repairs, motor	27,130.95	3.20
38-B	Repairs, chassis	13,978.79	1.65
38-C	Repairs, body	2,569.44	0.30
38-D	Tire repairs and renewals	12,029.34	1.42
38-E	Miscellaneous bus maintenance	3,539.00	0.42
40-A	Depreciation of buses	29,237.65	3.45
	Total maintenance of equipment	$94,220.71	11.11
63-A	Superintendent bus operation	$10,134.70	1.21
78-A	Operators' wages	53,711.66	6.33
78-B	Garage employees	4,676.12	0.55
78-C	Garage expenses	1,033.31	0.12
78-D	Gasoline	26,746.40	3.15
78-E	Lubricating oils and greases	3,756.19	0.44
78-F	Miscellaneous bus transportation expenses	9,821.13	1.16
	Total conducting transportation	$109,879.51	12.96
80-A	Advertising buses	$729.39	0.08
84-A	Salaries and expenses of general office clerks	1,181.03	0.14
85-A	General office supplies and expenses	1.47	.....
86-A	Law expenses	52.64	0.01
89-A	Miscellaneous general expenses	814.91	0.10
92-A	Injuries and damages	10,700.93	1.26
93-A	Insurance	448.76	0.05
94-A	Stationery and printing	402.76	0.05
95-A	Stores expense	1,268.74	0.15
	Total traffic and general and miscellaneous	$15,600.63	1.84
	Total operating expenses	$220,610.90	26.01
	Net operating revenue	*$21,279.35*	*2.50*
	Taxes	$1,673.98	0.20
	Net income	*$22,953.33*	*2.70*
	Operating ratio	110.68 per cent	
	Average passenger revenue per day	543.22	
	Revenue mileage	847,872	
	Revenue passengers carried	2,646,186	
	Gallons gasoline consumed	147,707.25	
	Miles per gallon gasoline	5.74	
	Gasoline cost per mile per gallon	3.15 cent	
	Investment, bus department, to Dec. 31, 1923:		
	Motor buses	$170,522.99	
	Elmwood garage	92,168.51	
	Miscellaneous	41,354.39	
		$304,045.89	

BUS LINE EARNINGS, MONTH OF DECEMBER, 1923, UNITED ELECTRIC RAILWAYS, PROVIDENCE, R. I.

		Earnings	Mileage	Receipts per Bus-Mile, Cents	Receipts per Bus per Da
1.	Olneyville-Eddy St.	$2,117.64	7,096.79	29.84	33.15
2.	Pawtuxet-Lakewood	75.80	1,200.24	6.32	10.95
3.	Pawtuxet-Warwick Downs	56.45	810.88	6.96	13.31
4.	Providence-Arctic*	7,673.68	31,329.83	24.49	66.20
5.	Providence-Broadway	7,841.05	22,042.81	35.57	45.86
6.	Providence-Oakland Beach*	3,859.90	21,336.94	18.09	39.36

BUS LINE EARNINGS, TWELVE MONTHS ENDED DEC. 31, 1923, UNITED ELECTRIC RAILWAYS, PROVIDENCE, R. I.

		Earnings	Mileage	Receipts per Bus-Mile, Cents	Net	Average Speed Miles per Hr.
1.	Olneyville-Eddy St.	$17,704.57	64,872.84	27.35	$869.30	6.07
2.	Pawtuxet-Lakewood	1,162.78	16,048.64	7.30	*3,002.71*	9.73
3.	Pawtuxet - Warwick Downs	2,123.68	13,175.78	16.15	*1,899.14*	10.40
4.	Providence-Arctic*	66,877.48	325,224.71	20.60	*17,594.66*	15.00
5.	Providence-Broadway	48,631.23	152,482.33	31.90	8,981.21	7.73
6.	Providence - Oakland Beach*	61,547.80	274,327.09	22.42	*9,848.34*	12.10
7.	Roger Williams Park†	144.35	1,640.05	8.80	*282.26*	7.60

* Six zones, 5 cents per zone, minimum fare 10 cents, no tickets, no transfers.
† Discontinued.
Figures in *italics* indicate a deficit.

AVERAGE REVENUE IN CENTS PER BUS-MILE, UNITED ELECTRIC RAILWAYS, PROVIDENCE, R. I., FOR YEAR 1923

Name of line	(1)	(2)	(3)	(4)	(5)	(6)
January	27.67	9.08	9.78	20.18	.....	17.27
February	28.36	8.93	9.68	20.45	.....	17.28
March	28.16	9.82	6.89	20.17	.....	18.01
April	28.27	7.48	8.68	20.39	.....	19.36
May	26.37	7.08	11.42	20.20	26.65	23.38
June	27.01	6.29	11.81	19.70	29.35	26.63
July	26.24	6.23	19.78	18.15	28.79	31.06
August	26.00	7.07	25.25	18.22	29.68	30.76
September	25.65	7.22	17.45	19.33	32.17	23.06
October	25.51	6.09	6.62	21.18	34.32	18.68
November	27.99	5.77	7.25	23.51	35.32	17.11
December	29.84	6.32	6.96	24.49	35.57	18.09
Average	27.34	7.25	16.14	20.56	31.90	22.42
Average all lines			23.40			

1. Olneyville-Eddy Street
2. Pawtuxet-Lakewood
3. Pawtuxet-Warwick Downs
4. Providence-Arctic
5. Providence-Broadway
6. Providence-Oakland Beach

78-A. Bus operators' wages are the same as those for two-man car operation, namely, 61 cents an hour. The operation is not considered as difficult as that on one-man cars, where a slightly higher wage is paid the men, since no standing load is carried, and there is not as much congestion.

89-A. Miscellaneous general expenses are charged against the bus on an arbitrary basis, prorated according to mileage operated by cars and buses.

92-A. The charge for injuries and damages in the 1923 statement is considered by the company to be abnormally high, and this is expected to be about 1 cent per bus-mile in the future instead of 1.26 cents as shown in this statement.

In the investment details given at the bottom of the table, the item of $92,168 for the Elmwood garage includes $19,000 of stock and spare parts and miscellaneous supplies. It also includes machinery and equipment and a wrecking truck.

The entry for taxes includes the charge of $75 average per bus for a license from the State Board of Public Roads; the cost of bonding, which averages $120 per bus per year with a $50,000 maximum liability; a corporation tax of 1 per cent of the load, which goes to the state; the war tax included in the purchase price of twelve new buses, and a property tax in Providence, which amounts to $2.30 per $1,000 of assessed value.

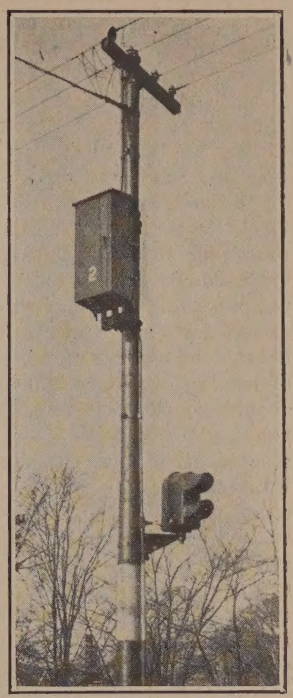
Gasoline consumption by the various buses during 1923 was at the rate of 1 gal. for each 5.74 miles operated. This varied for different types of buses and under different service conditions all the way from 5.45 miles per gallon up to 8.80 miles per gallon. Most of the roads over which the buses are operated are level, the paving is good and little bad weather was encountered during the months covered in the statement.

Recorder Shows if Cars Make Safety Stops

Automatic Block Signals and Headway Recorders Are Electrically Connected to Prevent Cars Running by Red Lights

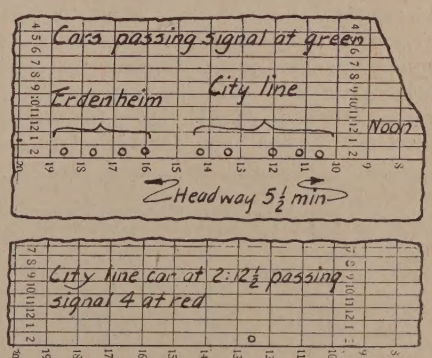
TO INSURE that motormen shall not fail to make the required safety stops on a bad hill at the outer end of its Germantown Avenue line, the Philadelphia Rapid Transit Company has recently installed a system of Nachod block signals operated in conjunction with headway recorders. From Chestnut Hill to the city line, a distance of about three-quarters of a mile, there is a long winding grade, which is rather deceptive because it appears less severe than it really is.

Two shuttle extensions of line No. 23 use this track, one going to the city line and the other to Erdenheim, the latter branching off Germantown Avenue and Hillcrest Avenue. Both lines operate one-man cars. Formerly, there were six safety stops located equally distant along the Germantown Avenue grade. It required careful supervision to see that these safety stops were always observed, and six blocks of automatic signals have now been installed to insure the taking of the required safety precautions.



Two - Indication Normal Danger Signal Used by the Philadelphia Rapid Transit Company on a Steep Grade

Each block has a two-indication signal, showing a red light normally which must be changed to green in the sight of the motorman before his car passes the signal and enters the block. Opposite the signal there is a setting contactor, and about 100 ft. before reaching the signal is a preliminary contactor. The setting contactor for one block acts as a clearing contactor for the block behind. When the trolley wheel of a car passes under the preliminary contactor, the motorman is only about 50 ft. away from the signal. Passing the contactor starts a time relay in operation, so that 5 seconds later the signal changes to green, unless there is a car already in the block ahead. The motorman must, therefore, bring his car to a stop in order to see the signal appear green before he passes. As soon as he passes the signal, the trolley wheel of his car changes it back to red again, the normal indication. So long as there is a car in the block, the signal cannot be changed to green. Thus, it not only serves as a safety stop, but also gives rear protection.



Cars Passing Signal at Green Record on One Side of the Sheet and Cars Passing at Red on the Other Side

A Nachod automatic headway recorder is connected to each of the signals, so that a motorman cannot pass by a red light without that fact being recorded. All cars passing the signal at green register on one side of the record sheet, while all cars passing the signal at red register on the other side. The chart is renewed daily, and shows the exact time that proper and improper passages were made. The motorman must either make the stop or report not having done so.

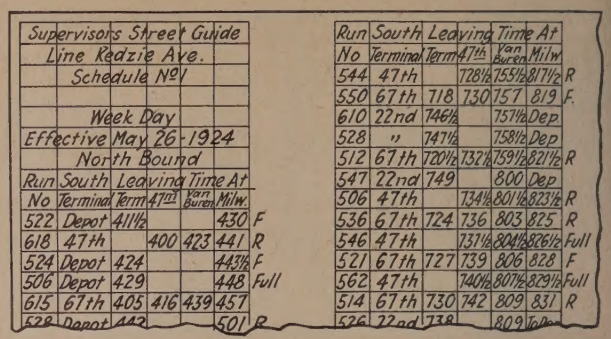
Chicago Adopts New Form of Time-Table

The Surface Lines Give All the Information About Each Run in One Place on the Time-Table, so as to Make It More Easily Read

THE Chicago Surface Lines has had in use for a little more than six months a form of carhouse time-table in which the figures and other data for the entire day's run of each crew can be found in one place. The purpose of this arrangement is to make it easier for each man to understand his day's work, because he can see at a glance his time of arriving and of leaving each terminal and the terminal to which he should go on each trip. By reference to a table of running times in the lower part of the time-table he can also tell the exact time required for arriving at each intervening time point. This form of schedule is considered by the transportation department of the company preferable to the more common form, for the reason set forth, namely, because it enables each trainman to focus his attention on a single rectangular space on the blueprint. Indeed, a regular man could be given simply a section cut from a schedule blueprint.

The large illustration shows the upper part of such a time-table, giving the details of four of the fifty-eight runs in division No. 7 operating out of the Kedzie Avenue depot, and effective for week days beginning on May 26, 1924. Where a line is operated from two carhouses, two run guides are prepared, one for the runs out of each carhouse. The form of the time-table, as shown, is so simple that practically no explanation is required, except in regard to the method of indicating the pay hours. The hour in Chicago is divided into ten parts, and in the run guide the pay hours are expressed in hours and tenths. The division office has the detail of this pay time, showing the time per piece, the various allowance and overtime, time of beginning and ending work, etc., in summarized form.

The form of the time-table drafted for the supervisors, i.e., the uniformed inspectors, is somewhat different. This time-table, known as a "supervisor's guide," is arranged according to the times the cars are scheduled to pass the principal time points on each route. This time-table shows for each run number the terminals of that run for each trip and the time the car is due at two or more of the major time points. The running time between these major time points and the time points of lesser importance is so well known to a supervisor that he can interpolate very readily if he needs to do so. The supervisor's time-table is blueprinted with blue numerals on a white background rather than in the usual form of white letters on a blue background, so that he can make any notes on it which he desires.



Supervisors Street Guide					
Line Kedzie Ave.					
Schedule No 1					
Week Day					
Effective May 26-1924					
North Bound					
Run	South	Leaving		Time At	
No	Terminal	Term	47th	Van Buren	Milw.
522	Depot	411½			430 F
618	47th		400	423	441 R
524	Depot	424			443½ F
506	Depot	429			448 Full
615	67th	405	416	439	457
528	Depot	442			501 R

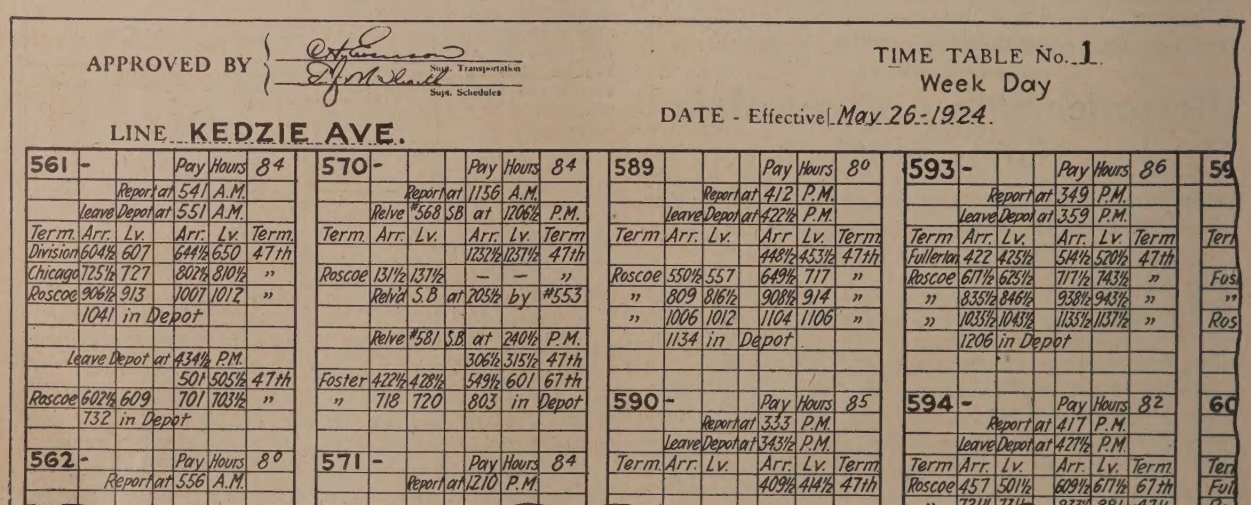
Run	South	Leaving		Time At		
No	Terminal	Term	47th	Van Buren	Milw.	
544	47th		728½	755½	811½	R
550	67th	718	730	757	819	F.
610	22nd	746½		751½	Dep	
528	"	747½		758½	Dep	
512	67th	720½	732½	759½	821½	R
547	22nd	749		800	Dep	
506	47th			734½	801½	823½ R
536	67th	724	736	803	825	R
546	47th			731½	804½	826½ Full
521	67th	727	739	806	828	F
562	47th			740½	807½	829½ Full
514	67th	730	742	809	831	R
526	22nd	738		809	To Dep	

Upper Part of a Supervisor's Time-Table

The experience of the company shows the great desirability of preparing time-tables for supervisors rather than the more common practice of allowing them to make up their own form of time-table from the run guides posted in the carhouse. To quote only one advantage, it economizes their time when a change in schedule is made, because the running time has to be figured only once for the entire corps of inspectors.

Another outstanding feature of the schedule department of the Chicago Surface Lines is the use of a fairly large number of running times during the day. Thus on some lines there are from six to eight running times between 6:30 a.m. and 6:30 p.m. With the individual form of time-table, however, these changes in running times should not confuse the trainman. He can tell directly from his time-table the time he is expected to arrive at the terminal on each trip and then can govern himself accordingly.

Another feature of the schedule department of the Chicago Surface Lines is a readiness on the part of the department to change the running time between time points, where changes in street conditions indicate that existing running times are either too fast or too slow.



APPROVED BY { Supt. Transportation / Supt. Schedules

TIME TABLE No. 1
Week Day

DATE - Effective May 26-1924.

LINE KEDZIE AVE.

561 -			Pay	Hours	84
	Report	at	541	A.M.	
Leave	Depot	at	551	A.M.	
Term.	Arr.	Lv.	Arr.	Lv.	Term.
Division	604½	607	644½	650	47th
Chicago	725½	727	802½	810½	"
Roscoe	906½	913	1007	1012	"
	1041	in Depot			
Leave Depot		at	434½	P.M.	
			501	505½	47th
Roscoe	602½	609	701	703½	"
	732	in Depot			

562 -			Pay	Hours	80
	Report	at	556	A.M.	

570 -				Pay	Hours	84
		Report	at	1156	A.M.	
	Relve	#568	SB	at	1206½	P.M.
Term.	Arr.	Lv.		Arr.	Lv.	Term
				1231½	1231½	47th
Roscoe	131½	131½		—	—	"
	Relvd	S.B	at	205½	by	#553
	Relve	#581	SB	at	240½	P.M.
				306½	315½	47th
Foster	422½	428½		549½	601	67th
"	718	720		803	in	Depot

571 -			Pay	Hours	84
	Report	at	1210	P.M.	

589			Pay	Hours	80
	Report	at	412	P.M.	
Leave	Depot	at	422½	P.M.	
Term	Arr.	Lv.	Arr	Lv.	Term
			448½	453½	47th
Roscoe	550½	557	649½	717	"
"	809	816½	908½	914	"
"	1006	1012	1104	1106	"
	1134	in	Depot		

590 -			Pay	Hours	85
	Report	at	333	P.M.	
Leave	Depot	at	343½	P.M.	
Term.	Arr.	Lv.	Arr.	Lv.	Term
			409½	414½	47th

593 -			Pay	Hours	86	59
	Report	at	349	P.M.		
Leave	Depot	at	359	P.M.		
Term	Arr.	Lv.	Arr.	Lv.	Term	Ter
Fullerton	422	425½	514½	520½	47th	
Roscoe	617½	625½	717½	743½	"	Fos
"	835½	846½	938½	943½	"	"
"	1031½	1043½	1135½	1137½	"	Ros
	1206	in Depot				

594 -			Pay	Hours	82	60
	Report	at	417	P.M.		
Leave	Depot	at	427½	P.M.		
Term	Arr.	Lv.	Arr.	Lv.	Term	Ter
Roscoe	457	501½	609½	617½	67th	Ful
"	721½	731	833½	881	471	Ros

The Chicago Surface Lines Has Adopted a Form of Time-Table in Which the Run of Each Individual Crew Is Shown Separately

Radio Calls Emergency Crews in Detroit

This Arrangement Enables the Three Electrical Department Emergency Trucks, with Their Crews, to Be Used for Outside Maintenance Work When Not on Emergency Service

The Emergency Man at Work

SINCE March, 1922, the Department of Street Railways, Detroit, has been experimenting with radio reception as applied to emergency trucks. The first experiments were carried on by means of a Ford touring car, as described in the issue of this paper for June 3, 1922, page 910. In May, 1923, three emergency trucks were equipped with receiving sets so that any one or all three crews could be summoned to the point of any trouble where their services were needed. The broadcasting is done from police headquarters, through operators who also broadcast news of stolen automobiles, holdups, etc. The system, which has proved so successful in the case of the Department of Street Railways for emergency trucks, has also been applied with very good results, during the latter part of April of this year, to the Police Department's patrol cars, or "fliers" as they are commonly termed.

Before the radio sets were installed on the electric railway emergency trucks, the crews had to stay in their stations to be ready to answer emergency calls by telephone. The only exception was when work could be done in localities where telephones were available, or, as was done in several instances, the crews did outside work but reported at frequent intervals by telephone to the despatcher.

In case of trouble on the lines, the despatcher at railway headquarters would notify the nearest emergency crew. After it had attended to the trouble for which it was summoned, it would return to its station. All the time that it was away from its station (emergency or temporary), the crew had to be constantly in touch by telephone with railway headquarters to learn if the services of the truck were needed elsewhere.

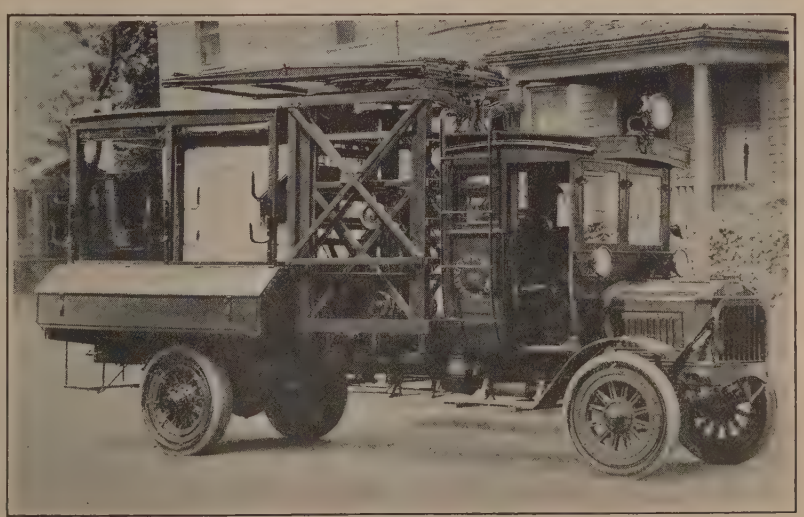
Radio has changed all this. Now any crew can be summoned at a moment's notice, no matter in what part of the city it may be. This permits the crews to do a great deal of miscellaneous outside work both in rehabilitation and maintenance, such as painting poles, replacing crossarms, cutting out annealing sections of trolley wire and substituting new, renewing worn-out ears, etc. It has been found that a great deal of this work can be done to better advantage at night than in the daytime. Thus, when poles are painted, particularly in the downtown district, there is no danger of spilling paint on pedestrians if the work is done at night, and it can be done more quickly. In renewing parts of the overhead construction, there is less traffic, both railway and vehicular, at night to interfere with the work.

As explained, the radio messages are sent out through the broadcasting station at police headquarters. This station is downtown, about half a mile from the city hall. Whoever named the station must have had a sense of humor, because it is officially known as KOP. This station broadcasts on a 286-meter wave length.

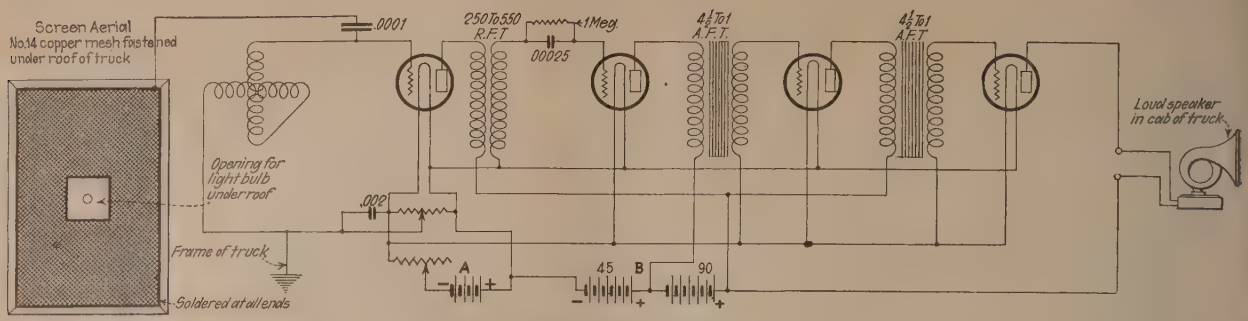
When the plan of broadcasting to the emergency trucks was conceived, this station had authority only to broadcast music and police news. To summon an emergency crew, the practice at first followed was as follows:

Crews Called by Music

When railway headquarters learned of a trolley break or other trouble requiring the services of an emergency crew the broadcasting station would be called (through a direct private circuit) and the broadcaster would put a piece of music on the victrola and broadcast it. All three crews then called the despatcher, who issued instructions appropriate for the occasion. In case one crew was sufficient for the trouble in hand, the other crews returned to their work. No attempt was made to pick and choose the type of music broadcasted except when KOP was broadcasting a musical concert, which it does occasionally. In that case the emergency crews only responded to one piece, viz., Sousa's "The Stars and Stripes Forever." Otherwise the music ranged from "Mama Loves Papa" to "The Tales of Hoffmann," depending upon the will and humor of the operator



These Emergency Trucks Are Told About Trouble by Radio



Hook-Up Diagram Used on the Emergency Trucks. Three of These Trucks Are Now Equipped with Wireless Receiving Sets

at KOP. Any amplification of this scheme which will call for a greater knowledge of music on the part of the crews obviously presents complications. It might make it necessary to require each member of an emergency crew to attend a recognized school of music.

Actual records with this wireless system of notification in Detroit show that the elapsed time between the receipt of a trouble call at railway headquarters and the report of a crew via wireless varies between three and nine minutes. The reporting by the crews is very materially expedited owing to the fact that they have access to the Police Department's telephones, located at frequent intervals along the main thoroughfares.

The expense to the railway department for this broadcasting service is the salary of one of the two radio operators. The broadcasting during this early period, or prior to April of this year, covered the period from 6:30 p.m. until 5 a.m., Sundays and holidays excluded.

Save $3,000 a Month

The direct gain to the railway comes from the amount of extra work which can be done by the emergency crews when otherwise they would be waiting in their stations. The record in May follows:

Number of radio calls to emergency trucks during May	30
Number of crew hours worked on line work by emergency crews who otherwise would have awaited calls at headquarters	822.5
Saving made due to these crews working all the time	$3,174.89
Maintenance and operation of radio equipment	250.75
Net saving	$2,924.14

Figures almost as good were obtained in earlier months.

The indirect advantage of keeping the men on the emergency crews busy instead of idle is undoubtedly also considerable, but is hard to evaluate.

Another feature of the practice with emergency crews is to rotate the crews among the different stations. In this way all the crews know all parts of the system. Incidentally, the foremen of the construction and maintenance crews are also rotated with respect to the crews, so that they learn to work with each other.

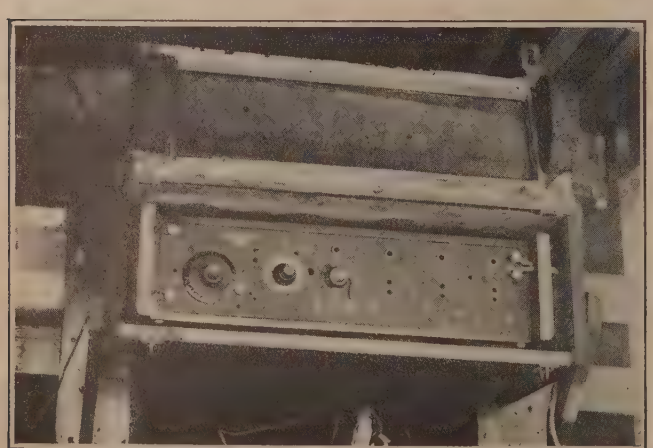
Broadcasting Plan Changed in April

As a check on whether the radio equipment was in service, it was the practice, prior to April, to run a test with a piece of music each evening at 6:30 p.m. The men would then report to the main emergency station at St. Antoine Street.

A change in the method of broadcasting had to be made in April under a ruling of the government that KOP had authority to broadcast music, but not when that music was used to notify utility crews that their services were needed. The department then tried broadcasting on 100 meters, but it was not satisfactory. Application was then made to the government to permit broadcasting for the summoning of emergency crews, and authority was finally granted by which a modified point to point broadcasting is now permitted. Under this plan, KOP, when it wanted to summon an emergency crew, broadcasted the emergency truck number and the type and location of the trouble, following this announcement with a victrola selection. The truck number, type and location of trouble were then repeated, followed by a victrola selection. KOP then signed off.

In June the plan was again changed by omitting the music, as it was found not necessary. The present plan, therefore, is for the broadcasting station to broadcast the information a few times and then sign off.

Altogether there are three emergency trucks, each



Receiving Apparatus Mounted on the Back of the Driver's Seat

This Is the Aerial Carried on the Emergency Truck

having three crews on eight-hour shifts, the broadcasting since April, 1924, having been done each day, except Sundays and holidays, from 11 a.m. until 3 a.m. Later, it is expected that three shifts will be put into effect, i.e., the system will be worked for twenty-four hours a day.

It is further anticipated that ultimately the electrical department's six construction trucks, one fire truck and the track department's two emergency trucks may be equipped with radio apparatus. The department realizes that there are many other applications for such apparatus not yet developed, such as equipping snow plows, snow sweepers, etc. These will doubtless receive consideration at a later date.

Receiving Apparatus on the Emergency Truck

The receiving apparatus on the truck is placed horizontally in a box with a glass cover on the back of the driver's seat about midway between the floor and the roof. The aërial consists of a copper wire screen, attached to a wooden frame and mounted horizontally under the roof of the body, housing space being left for a "dome" light. The screen is made of No. 14 gage wire and is carried on a wooden frame about 4 ft. x 5 ft. The edges of this screen are soldered and the lead wire is soldered to the screen at one corner. The frame of the truck is used as a counterpoise. There are four tubes, one radio frequency, one detector and two audio frequency. For tuning, a variometer is used, and all condensers are of the fixed type. This apparatus is suspended on and surrounded by sponge rubber. Originally springs were used, but sponge rubber was found to be more satisfactory. The "A" battery consists of an ordinary 6-volt, 120-amp.-hr. automobile storage battery, of which there are five assigned to this work, one for each truck and two as spares. The batteries are charged once every four days. The "B" battery lasts about two months.

The loud speaker is of the Westinghouse type, carried under the hood in the cab. The "A" battery switch is also in the cab. The department does not depend on the crews to check the apparatus, but has an inspector to check it. The variometer is fixed at 286 meters, so that it will respond only to that wave length, which is the wave length of the station.

The hook-up used is fundamentally an Eisemann, but with some modification. A wiring diagram is shown herein.

Some difficulty has been experienced with interference from other broadcasting stations when the trucks are within a quarter of a mile of such stations. The intensity of the sound is reduced somewhat, also, when the truck is under a steel viaduct. No interference is noted when the truck is under trolley wires, but the set is inclined to be noisy when the truck is adjacent to overhead 23,000-volt transmission circuits, especially on wet days. None of these drawbacks is serious, however; they simply require closer attention on the part of the crews.

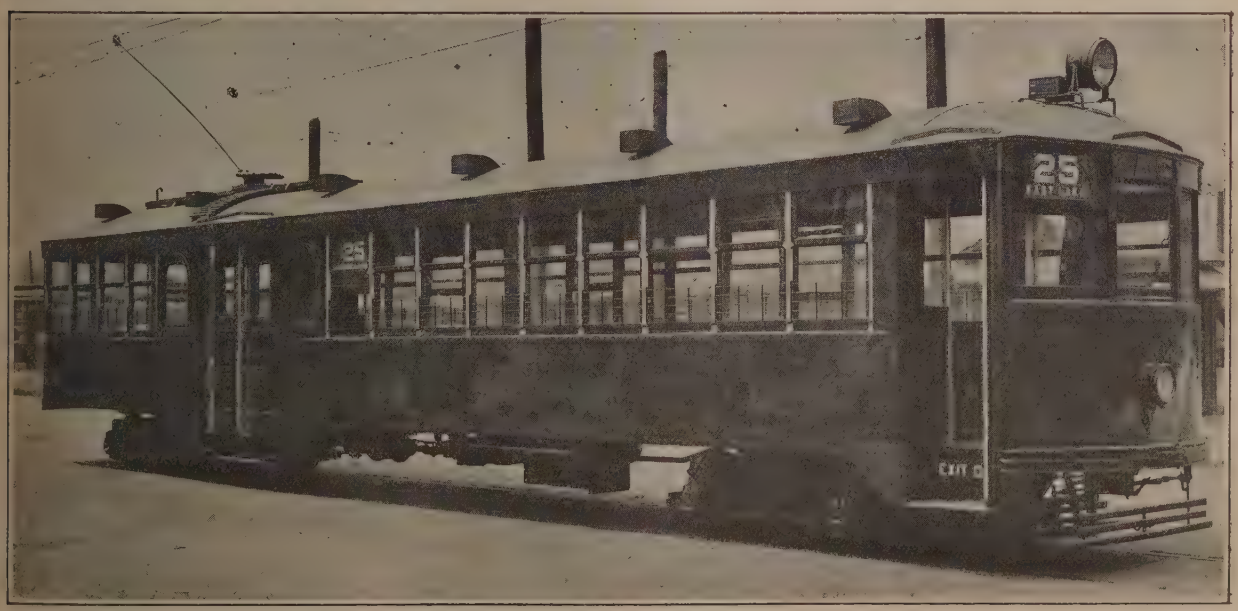
Double-Truck Cars Weigh 564 Lb. per Seat

New Side-Entrance Cars of the Birmingham Electric Company Are of Light-Weight Steel Construction and Seat 62 Passengers—A Unique Arrangement Is Made for Separation of the Races

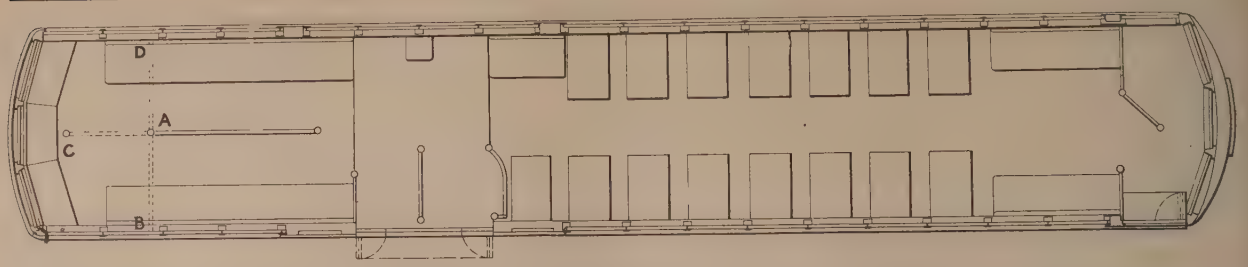
TWENTY new side-entrance steel cars were received and placed in service by the Birmingham Electric Company, Birmingham, Ala., during May. They are of the Cincinnati light-weight curved side construction, but differ from previous designs in that the stiffening panels are beside the center doors instead of being at the ends of the car. Seats are provided for 62 passengers. The total weight, including car body, trucks and equipment, is only 35,000 lb., or 564 lb. per seated passenger.

Each car is equipped with four General Electric No. 265 motors of 35-hp. capacity. A maximum gear reduction is used, giving the car a free running speed of 36 m.p.h. with very quick acceleration. The trucks are Brill 76-E with outside-hung motors. Cast-iron wheels of 26-in. diameter are used.

A special feature of the car is the seating arrange-



New Birmingham Side-Entrance Car Specially Designed for Separation of the Races



Floor Plan of Birmingham Car Showing How 62 Seats Are Provided

GENERAL DIMENSIONS

Length over all	49 ft. 5 in.
Length over dash	48 ft. 7 in.
Length of white compartment	25 ft. 5 in.
Length of colored compartment	14 ft. 0⅜ in.
Extreme width	8 ft. 5 in.
Height rail to trolley board	10 ft. 8 11/16 in.
Height from rail to side sill	2 ft. 4 3/16 in.
Window post centers	2 ft. 5 in.
Center door opening	5 ft. 0 in.
End door opening	2 ft. 5 in.
Truck centers	32 ft. 0 in.
Truck wheelbase	4 ft. 10 in.
Width of seat	36 in.
Width of aisle	25 in.
Height rail to first step, center	13 in.
Height first step to platform, center	10 in.
Height platform to car floor, center	7 in.
Ramp in platform, center	1 in.
Ramp in car floor, center	1 13/16 in.
Height rail to step, front	16 5/16 in.
Height step to car floor, front	14 in.
Ramp in car floor	2¼ in.

ment. In Birmingham a city ordinance requires the separation of the races inside the car and entering the car. To do this is made more difficult by the fact that the relative number of passengers of the two races varies greatly at times. Usually, however, the number of white passengers exceeds the number of colored passengers. For that reason the side door was placed toward the back, allowing approximately one-third of the seating capacity for the colored people and two-thirds for the white people.

All passengers enter by the side door. White passengers leave by the front door, and colored passengers by the same door through which they enter. The side doors are operated with National Pneumatic door engines, while the front door is manually operated by the motorman.

Normally the white section has 40 seats and the colored section has 22, but a more accurate adjustment of the seating capacity to suit the varying proportions of white and colored passengers is accomplished by means of stanchions and railings in the rear portion of the car. A swinging rail rotates around the vertical stanchion, located at *A* on the accompanying floor plan, and may be placed in any one of the three positions indicated as *B*, *C* or *D*. The amount of space available for colored passengers may, therefore, be varied from almost nothing to the entire rear third of the car. In the latter case this rail swings into a vertical position alongside the stanchions at *A*.

The principal dimensions of this car are given in the accompanying table. Complete specifications were published in the ELECTRIC RAILWAY JOURNAL for March 8, 1924.

In This Car All Passengers Enter by Center Door. Colored Passengers Leave by Same Door and Whites by Front Door

Many Benefits from Power Conservation

BY F. HOLLINGSWORTH
Supevisor of Power Saving San Diego Electric Railway

ASIDE from a 10 per cent saving in the consumption of power, instructions and training given motormen relative to power conservation have proved to be among the greatest factors in raising the standard of platform efficiency.

The words "platform efficiency" cover a wide range of operation, including numerous important factors other than the saving of power. When a motorman becomes interested in saving power, he naturally takes an interest in the operation of car motors, learning more about the proper transmission of power than he would do otherwise. The knowledge so gained has a tendency largely to eliminate the abuse of motors and other parts of the equipment by allowing the car to coast when possible. This tends to keep down the temperature of motors, and at the same time eliminates many hard brake applications, thus prolonging the life of motors and brake equipment.

It is noticeable that a reckless operator is seldom low on power consumption. The same applies in regard to accidents, as 90 per cent of our operators who run low on power also show a marked decrease below the average in the number of accidents, indicating that safety and the saving of power go hand in hand. The prevention of accidents is a very important factor in the saving of dollars and cents, and since the training a motorman receives in the conservation of power has a tendency to make him a careful operator, the benefits are many and far reaching.

While it is very difficult to evaluate the saving which Economy meters bring to the mechanical department, nevertheless they are there and are very much worth while. We have no definite figures at hand showing the saving made, but it must be apparent to all who are in a position to know that proper judgment in the use of power and brake applications means fewer turn-ins on account of motor trouble, fewer brakeshoe replacements and less liability of flattened wheels.

New Traffic Control Successful in Philadelphia

Installation of Master Signal Lights on the City Hall Tower Speeded Up Both Street Railway and Vehicular Movement, but Council Failed to Make Appropriations Necessary for Its Continuance

SYNCHRONIZATION of traffic movements on Market Street, Philadelphia, east and west of the city hall and on Broad Street north and south of that point was successfully accomplished for several weeks during May and June of this year by the installation of four master signals, one on each side of the city hall. This arrangement was part of a plan worked out by Gen. Smedley Butler, Director of Public Safety, to relieve congestion in the center of the city. While based in theory on the plan adopted some years ago for regulation of traffic on Fifth Avenue, New York City, the Philadelphia plan differed from it in a number of important details. The scheme was still in the experimental stage, but it had already resulted in an important increase in the speed of both street railway cars and other vehicles when the City Council brought it to an end on July 1, by failure to make necessary appropriations.

Master Signal Lights on Philadelphia City Hall Keep Market Street Cars Evenly Spaced

The plan called for the installation at a point about 350 ft. above the pavement of four 300,000,000-cp. searchlights, one on each face of the city hall tower. To obviate the necessity of those in the immediate vicinity of the city hall craning their necks to see the master light far up on the tower, a floodlight of 500,000 cp. was placed on each side of the building nearer the street level. Only one of the larger lights, that on the north side, was put in operation, but three more were contemplated. The four floodlights, however, were in place and were used for the regulation of traffic on the three other sides.

The master control signal consisted of only one light, orange red in color, and signals were given by turning on and off this single light. There were no other lights of different colors. This simple arrangement was possible because the primary function of the master light was to signal the traffic policemen rather than to signal the individual drivers of vehicles. When the red light was on, all traffic in both directions on the street in question stopped and the cross-streets were opened. As soon as the light went off cross-traffic had to stop and through traffic began to move.

An important feature of the plan was the latitude allowed to the individual policeman on the street. The time intervals of the master signal were necessarily based on the requirements of the heaviest cross-street. For that reason there were occasions at less important intersections when through traffic was stopped although no cross-traffic was waiting to move. In such cases, and in cases where there was waiting cross-traffic but no moving through traffic, policemen were allowed to exercise their discretion in order to speed up the movement.

Comparatively short time intervals were used on Market Street where the surface cars of the Philadelphia Rapid Transit Company operate. Somewhat longer intervals were used for the Broad Street signal. It was planned to regulate the searchlights by a mechanism made up of two disks. As the portions of these disks in relation to each other were changed, the lengths of time during which there would be light and no light were determined. These intervals could then be changed at will simply by removing the disks, and in fact it was the practice during the experiment to change the intervals several times during the course of the day to fit the needs of the situation at different hours.

The shortness of the intervals on Market Street was a contributing factor to the success of the scheme so far as it affected the street railway. Synchronized control resulted in keeping the cars separated into numerous small groups instead of allowing an accumulation of cars waiting to cross the busiest intersection

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as had been the case previously. Time intervals were arranged to fit the needs of this busiest point and the cars were "pushed across" as rapidly as before. Other cars, however, were held at intersections slightly less congested for a little longer time than might otherwise have been necessary, and were thereby prevented from creeping up and accumulating in large numbers at the most congested point. This phase of the operation of the new signal system is clearly shown in the accompanying illustration.

Under the new system, traffic movement was synchronized for 9 miles north and south on Broad Street and for 2 miles east and west on Market Street. As the Philadelphia Rapid Transit Company operates approximately 20,000 car trips through the downtown streets in the synchronized zone every day, extensive readjustment of car schedules was required. It is said that the westbound running time through the congested district on Market Street was reduced 10 minutes during the rush hour by the operation of the new plan.

General Butler explained the new system as being primarily a method adopted to avoid the necessity of installing expensive individual synchronized signals at many corners. To do that would require several years and cost $300,000. It was thought that the installation on the city hall tower of a single extremely powerful light which could be seen for miles would save the expense of many smaller lights at individual corners.

Several disadvantages to the plan as it developed during the trial resulted from the fact that the old hand semaphores which were formerly operated by traffic policemen at each intersection had been removed. It was difficult, therefore, for most of the traffic approaching an intersection to determine how to act. Only the drivers of those vehicles going in the direction of the city hall could see the master control light. Drivers going away from the city hall and drivers on the cross-streets could tell only by the actions of the policemen at the intersection what they were supposed to do. For this reason there was a certain amount of agitation for the restoration of the local semaphores.

Super-Highway Plan for Detroit Suburbs

These Highways Will Care for a Four-Track Rapid Transit Line and Express and Local Motor Ways

A SYSTEM of super-highways, each 204 ft. wide and extending from Detroit in all directions, has been recommended to the rapid transit commission of that city by its consulting engineer, Daniel L. Turner, and its engineer in charge, John P. Hallihan. The width of such a highway would be divided up as follows:

A central space of 84 ft. for the exclusive use of rapid transit lines on rails and the tree and shrub planting to screen it.

A 20-ft. roadway for express motor traffic on each side of the central space, making 40 ft.

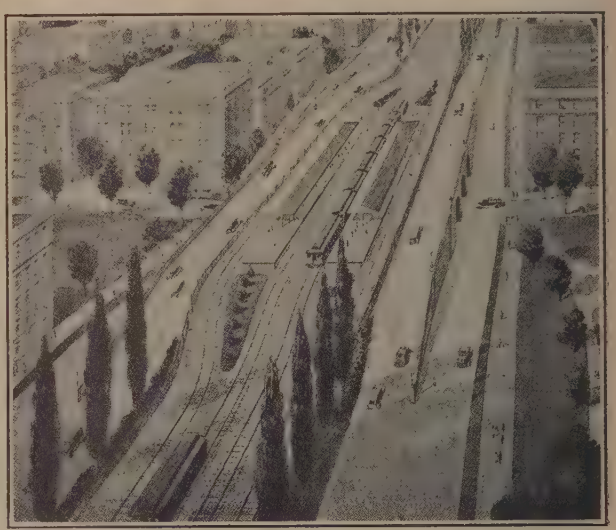
A 5-ft. planting or safety strip zone on the outside of the express roadway, making 10 ft.

A 20-ft. roadway for motor parking and local motor traffic on each side, making 40 ft.

A 15-ft. sidewalk on each side, making 30 ft.

The engineers point out that Detroit is growing rapidly and the present transportation arteries are becoming inadequate to accommodate the demand. In 1950 the city will probably extend out 11 miles from the present center, and in the year 2000 it will have a radius of 15 miles. It is for sections which are now almost entirely outside the city that the proposed super-highway system is designed. On such super-highway two-track rapid transit lines are recommended at the start. There should be sufficient width for ultimately four tracks.

For the present built-up city sections, the cost of acquiring the necessary land for such wide highways would be prohibitive. Within these built-up sections the rapid transit lines would have to go underground,



Arterial Highway for Greater Detroit

so as to cut the width of the thoroughfare to 120 ft., a width which will accommodate comfortably a four-track rapid transit line.

The report says that on Fifth Avenue, New York, where probably the densest traffic prevails, it has been estimated that the maximum capacity for a single traffic lane may be taken at about 600 motor vehicles per hour, with through traffic moving only about 42 minutes out of the hour. Similar observations made in Detroit on Woodward Avenue indicate a movement of about 440 vehicles per hour per traffic lane. But along one express motor traffic lane on a super-highway, with no crossing interferences and where the movement is continuous and at high speed, it has been conservatively estimated that 4,000 automobiles per traffic lane per hour can be accommodated. This is nearly seven times the capacity of a traffic lane of Fifth Avenue capacity and nearly ten times that of Woodward Avenue. This indicates what may be obtained by abolishing the intersection of cross-streets which, in the proposed plan, would pass under the highways at intervals of about ½ mile.

In submitting this report to Mayor Martin of Detroit, the rapid transit commission says that a special act will be necessary to make it legal as well as to provide means for financing the acquisition of the necessary land for the wide rights of way. The immediate need is not pressing, but the rights of way should be secured. Much of the property to be acquired is not within the present limits of Detroit, but the commission says it has received the utmost encouragement in its plan from the representatives of the various political subdivisions within the 15-mile circle of Detroit.

Apparatus Developed on the North Shore Line for Digging Holes. It May Be Converted Into a Machine for Setting Poles

North Shore Adopts Catenary Suspension

Each Power Line Pole Will Ultimately Be One Support of a Bridge—Use Made of Specially Rigged Line Car for Facilitating Work of Setting Steel Poles—Upon Completion of the Work Pantograph Trolleys Will Be Used on the Cars

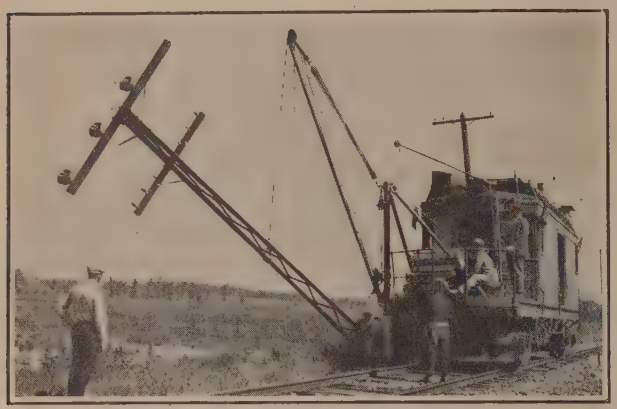
BETWEEN Waukegan and Kenosha the Chicago, North Shore & Milwaukee Railroad is installing a 33,000-volt, 60-cycle, high-tension line, the poles of which will ultimately be used to support the catenary overhead trolley, which will become the standard type of conductor system for the road. This high-tension line became necessary in order to provide additional power facilities for the North Shore Line. It extends from a junction with the 132,000-volt line of the Public Service Company of Northern Illinois just north of Waukegan to the Kenosha automatic substation of the railroad. The three-phase line is carried on Bates 7-in. x 35-ft. poles, spaced at 180-ft. centers, set 10 ft. 8 in. from the center line of the southbound track. Each steel pole will be used as one support of a bridge from which will be suspended the catenary overhead construction. Following the completion of this type of overhead, the North Shore Line will adopt pantograph collectors.

In constructing this pole line, the electrical department of the North Shore Line made use of a specially rigged line car for digging the hole for the concrete foundation, and also for placing the pole on the foundation after it had set. Use was also made of a concrete mixer and train. The digging and hoisting outfit was developed by the electrical department and consists of an air-operated jib hoist from which is suspended an air-driven earth-boring tool. The construction of the hoist is particularly interesting inasmuch as it is collapsible and may be changed from one side of the car to the other. Steel tubing of two sizes is used for the compression members of the stationary part of the hoist, while a 1-in. rod with turnbuckle is used as the tension member. The main upright is of 5-in. tubing set in a socket at its lower end and braced by two 3-in. members at its upper end. These members are secured to the steel subframe of the car by bolts. The boom, which is a 20-ft. wood pole, is supported by block and tackle fastened to the top of the stationary upright. This tackle is hand operated.

The elevating hook is propelled by an air-driven winch mounted on the center line of the car near the end of the platform. A ¾-in. rope travels over three aligning pulleys on the stationary support and then over the pulley at the end of the boom. The air winch used is of 2,000 lb. capacity and was manufactured by the Sullivan Machinery Company. The air supply for operating the hoist is obtained from the car reservoirs, which are furnished with air from two 25-cu.ft. per minute air pumps. This outfit is capable of raising the pole into position with the crossarms, insulators and fittings all in place. These have been attached when the pole was on the ground by one man. If this was to be done after the pole had been set it would require two men on the pole and another on the ground.

When the outfit is used for digging, the boring apparatus is suspended from the hoist. The boring tool resembles a small orange peel bucket with the sections so designed that they serve as cutting blades. The tool is raised from time to time and by opening the jaws or sections the contents is discharged. The propelling mechanism is an air drill of large capacity supplied

with air from the car reservoir and pumps. The boring tool was developed by the Grunter Manufacturing Company and is capable of drilling a hole in soft clay 2 ft. in diameter to a depth of 6 ft. in approximately 6 minutes. A "Y" shaped brace or torsion arm connects the handles of the suspended air drill with the car,



The Pole Is Raised Into Position with the Cross Arms and Insulators in Place

in order to prevent the apparatus rotating during the digging operation.

When the line car is moving the jib boom is lowered and fastened alongside the channel side frame of the car. The upright framework is left up if more work is to be done in the near future. However, the frame is of such construction that it may be easily dismantled and stored in one of the longitudinal compartments of the car. The members are also designed so that it is possible to place the hoist on either side of the car. The air winch, being in a central location, serves both positions.

After the hole has been dug it is trimmed up by hand so that it will accommodate the rectangular wooden form into which the concrete is poured. A train consisting of sand, gravel and cement supply cars, together with a flat car upon which is mounted a steam driven 1-yd. capacity concrete mixer, furnishes the concrete. The chute on the mixer is of sufficient length to reach to the center of the opening of the form. The foundation extends 6 ft. below the surface of the ground and is brought up so that its surface is level with the top of the rail. Imbedded in the concrete are four 1-in. bolts 6 ft. long to which the Bates pole is fastened.

After the second line of poles is set on the opposite side of the right-of-way they will be joined with the present poles by two light steel angle members placed 23 ft. above the rail. This bridge will carry the catenary construction. A short section of the road near Milwaukee has already been equipped with this type of overhead.

The Readers' Forum

Taxicab, Bus and Railway Co-ordination

FORD, BACON & DAVIS, INC.
NEW YORK, July 7, 1924.

To the Editors:

The review of street railway traffic statistics for the period 1920 to 1923 inclusive in some of the cities in the United States having in excess of 100,000 population, written by J. F. Layng and published in your issue of June 28, shows in general a population increase with a decrease in revenue passengers carried. Of the 46 cities whose figures for 1920 and 1923 are listed, 33 show decreases in revenue passengers, and of the 19 cities between 100,000 and 250,000 population all but 3 show decreases in revenue passengers between 1920 and 1923. This decline in rail traffic is principally due to the operation of privately owned automobiles, and no one can now predict the end. The wholesale value of passenger automobiles and parts manufactured in the United States in 1922 was about $2,975,000,000. It is now probably the first industry in the country in value of products produced per year.

Although electric railway traffic is going backward, a study of transportation records, as I pointed out about a year ago in your paper,* shows that the passenger miles traveled per capita by the population of the con-

*See article by Mr. Davis in ELECTRIC RAILWAY JOURNAL, June 23, 1923, page 1035.—EDS.

Left—Catenary Overhead Construction Will Be Carried on a Steel Bridge Which Connects Two 7-In. x 35-Ft. Bates Poles. This Will Ultimately Be the Standard Type of Construction on the North Shore Line. Right—Concrete for the Bates Pole Foundation Is Poured Directly Into the Form from the Mixer Mounted on a Flat Car Which Forms Part of the Concreting Train

tinental United States in all conveyances is rapidly increasing. This suggests that the electric railway industry should take a page from the book of the manufactured gas industry. Manufactured gas was founded as a lighting utility and flourished as such up to 1880. With the advent of the electric light it looked as if the gas industry were doomed, but the development of the use of gas for fuel not only saved the situation but enabled gas companies to reach heights that had never before been anticipated.

Street railway companies were not organized simply to engage in a part of the street transportation business, but to carry *en masse* any passengers seeking public conveyances from any place to any place. They have had this obligation from the beginning and now have it.

Fewer advances have been made in this business during the twenty years just ended than have occurred in almost any of our other basic industries. Owners have not seemed to realize that the laws of change, growth and extension prevail here as elsewhere. Imagine the continuance of the hansom cab of 1900 in the street-carrying business, in competition with the taxicab of today.

Transportation by water, roadway, rail and air is quite analogous in requirements and potential completeness to that in the blood circulating system. We have the trunk line arteries, the veins, the arterial and venous branches leading to special distribution centers and, most important, the capillary routes reaching the isolated individual points of destination.

In the early rudimentary organization of transportation a capillary system was not of great importance, but with the growth of the cities and city areas and changes in residence requirements individual rapid transportation to the ultimate location of the passenger has become a requirement. This necessitates the taxicab and bus service.

Rail roadways, owing to inflexibility in use, have from the first been lacking in special advantages for individual transportation and delivery. In not adopting other means for supplementing and extending this service to the extent of the complete requirements in delivery of the individual passenger, the industry has failed to grasp its opportunity as a universal street carrier.

In a general review made by the writer of the transportation facilities and requirements of 50 principal cities in the United States, each having a population in excess of 100,000, it appears that there should be in a co-ordinated street transportation service of taxicabs, buses and street cars, depending upon the type and size of city, approximately the following:

One 5-passenger taxicab, of present type, maximum capacity, to each 600 of population.

One 68-passenger bus of double-deck type, maximum capacity or equivalent to each 2,500 of population.

One double-truck 44-seat passenger express motor street car with trailers for peak periods or equivalent to each 1,000 of population.

The cities in question have a combined population (1920 census) of about 30,000,000, revenue street car passengers per annum of 7,000,000,000, transfer passengers 2,500,000,000 and revenue car-miles of 1,000,000,000.

Based upon a population of 30,000,000, the potential number of vehicles for the immediate future in this proposed co-ordinated service in the cities considered would be: Motor passenger cars, 30,000 with trailers; buses, 12,000, and taxicabs, 50,000.

The relative importance of the automobile and electric street railway industries is shown by the amount of money invested in each. The total present value of electric street railway property in the United States after all previous expenditures is about $6,000,000,000, whereas the yearly expenditure for automobiles and parts is approximately $2,500,000,000.

The comparative extent of service of passenger vehicles of each type is shown by the passenger miles per capita per annum of each. This, in 1922, was about as follows:

Steam railroads	427
Street railways	364
Taxicabs, buses and private passenger automobiles	786
Miscellaneous	46
Total	1,623

The ratios just given apply to the present relative status of the street transportation business. For the future, if present tendencies continue, there will be a marked readjustment as between roadway and rail vehicles.

Again I want to emphasize that the original purpose of the organization of street railway companies was not to engage in a part only of the street transportation business, but to carry practically all passengers seeking public conveyances. They should now, through new and old means of street transportation, regain their former position.

The present electric railway company in any city should not be content to undertake only transportation there by rail. The companies should, through new and old means, carry all passengers seeking public conveyances. As pointed out in the article in your issue of June 23, 1923, already mentioned, this would mean for the present electric railway companies:

1. The inauguration of a supplemental taxicab and bus operation, co-ordinated with the operation of the various lines of an express street car service.
2. The remodeling or supplementing of their roadways and equipment for express service.
3. The development of public sentiment in cities so that vehicular traffic on street-railway tracks will be lessened and limited through effective traffic regulations, particularly in congested areas, enabling reasonably high speeds by the street railway cars for the proper accommodation of the public.
4. The reorganization of their plans of operation.

This combination may save the situation for the taxicab, bus and street car services, which are at present, under independent operation, often triplicating a service for which they are not fitted and, through defective organization and resources, failing to earn a reasonable return on the respective investments.

GEORGE H. DAVIS.

Gaudy Seal Preaches Safety

A BRIGHT red and white sticker in the shape of a seal is used by the Union Street Railway, New Bedford, on outgoing mail. The words "Don't Get Hurt" are prominent in the design and the safety first idea is thus brought prominently to the attention of all local people receiving mail from the railway. The gaudy color of this poster stands out strongly in contrast to the color of the envelope, and attracts attention.

Association News & Discussions

Operating Problems with Electrification*

Various Methods and Practices Used in Handling Long Freight Trains on Heavy Grades with Electric Operation Were Reported on at the Annual Meeting of the American Railway Association

THE reports of a sub-committee appended to the report of the committee on electric rolling stock presented at the annual convention of the American Railway Association, Division 5, Mechanical, at Atlantic City, June 14, gave some information on the operating problems encountered in handling long freight trains under electric operation on heavy grades. The information presented was derived from the experiences of railroads in the United States on which electric traction in mountain territory has been in use for several years.

In each case the immediate results have been increased tonnage per train and increased train speed. These two things, whether brought about through the use of more powerful steam engines or with electric locomotives, produce certain problems. Communication between head and rear ends of trains will be more difficult and the slack action will be more pronounced. As a matter of fact, these features are more easily overcome in the case of electrification than under steam operation because electric locomotives produce a more uniform rate of speed and are subject to closer control.

In former years, when operating double-head or with pusher, it was the universal practice to signal by means of whistle blasts, but with the increase of train lengths this method became more and more unsatisfactory. The method now used in electrified territories of signaling with slack action through the train, produces a much smoother train operation.

There is no difficulty involved nor is there a serious burden placed on the operator in the control of trains on descending grades through regenerative braking; in fact, the operator's task is greatly lessened, for it is merely a matter of proper manipulation of his control, and he is always in possession of an additional factor of safety from the air brakes with a fully charged train line. The only existing problem is that of impressing upon the motormen the necessity for the same care to insure air brake operation as with steam operation.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY

The Chicago, Milwaukee & St. Paul has 647 miles of main line electrification. Two territories are involved, the first, which embraces the Rocky Mountain and Missoula Divisions, and the second, embracing the Coast Division. These two sections of electrification include practically all of the mountain grades of this railroad.

Helper locomotives are used on eastbound tonnage trains out of Cedar Falls, Kittitas, Avery and Butte yards and on westbound tonnage trains out of Piedmont, Haugan and Beverly of 2,500 tons. Trains are handled with one locomotive on the 1 per cent grade west bound out of Harlowton, and the train is doubled over the short 2 per cent grade between Bruno and Loweth.

In the operation of helpers, the helper locomotive is placed in the center of the train to equalize the tonnage as nearly as possible. This practice has been found desirable to eliminate excessive drawbar strain and to overcome derailments from the tendency of buckling the train.

The handling of tonnage trains on grades and curves with locomotives placed at head and middle of train has been satisfactorily accomplished by readily interpreted signals transmitted through the train. When starting a train, the lead locomotive begins to pull and the engineman of the second locomotive, when he perceives the slack going out, applies power to his locomotive, thus starting the rear half of the train and accelerating at approximately the same rate as the lead locomotive. If the electric pusher were to push the train up onto the lead locomotive and hold the train until the lead locomotive was ready to proceed, as is customary in steam operation, the electric equipment on the helper would be subjected to an unnecessarily and probably injurious overload.

In the electrified territories, there are numerous tunnels and many curves, making it impractical to depend upon hand or light signals entirely, therefore the following method was devised for testing brakes at the summit of grades before making the descent.

When approaching the summit of the grade, the train is permitted to stop of its own accord and the engineer on the leading engine makes a 10 to 12 lb. reduction of brake pipe pressure; this is noted by the trainman in the caboose, who in turn increases this brake-pipe reduction by gradually opening the brake-pipe valve in the caboose until a full service application is made, or a total of 20 or 25 lb. This gives assurance to all concerned that the brakes may be applied from either end of the train and are operative throughout.

The most necessary task in successfully operating freight trains is the control of the train slack in or out slowly and without severe shock. A correct understanding of this feature of handling and ability to control accordingly results in successful operation.

The time element is an all important element, and the control operations should not be hurried. This applies in starting, stopping or changing from motor action to regeneration, or vice versa. To stop freight trains successfully there should be no change in train slack during the time train brakes are applied as the slack should be run in before the train brakes are applied and engineer's brake valve manipulated in a manner that will result in slack remaining run in until the train is brought to a stop.

The current required to start a tonnage train, particularly on heavy grades, is high and the train should be brought up to speed as quickly as practicable (within 15 to 20 minutes), in order to prevent damage to the electrical apparatus, especially the resistance grids. It is also more economical to utilize the electrical energy for accelerating the train to the free running speed than to dissipate it in the resistance through which the current must pass while the controller is on the intermediate notches.

Special rules and instructions have been developed with the adoption of electric traction, many of which have resulted in better train operation.

When starting regenerative braking some care is necessary on the part of the engineman to avoid severe shock, due to train slack. The most practical and safe method of starting regeneration is to make a train brake application, and while this is effective make the adjustment of levers so that regenerative braking will start slowly to be effective, being governed by the speed and indication on ammeters as to the proper time to release the train brakes. The retaining valves then gradually leaking off their holding effect permits, regenerative braking to be gradually increased to full effect without undue shock to train and without causing line surges in trolley voltage.

Overheated and cracked wheels are almost unknown in the electric operated territory, trains making a continuous and unvarying movement from summit to foot of mountain grades.

NORFOLK & WESTERN RAILWAY

The electric operation of long freight trains on the Norfolk & Western consists principally of handling heavy coal trains at comparatively slow speeds over what is known as the Elkhorn Grade, crossing the Allegheny Mountains in McDowell County, W. Va. The service consists in hauling empties

*Abstract of report presented at the convention of the Mechanical Division of the American Railway Association, Atlantic City, N. J., June 14, 1924.

westbound from Bluefield to the coal fields, delivering them to the mines and hauling loads back over the eastbound grade and on to Bluefield, the eastern terminus of the electrification.

If a train of empties is to be delivered to the mines located on the descending grades between Coaldale and Northfork, W. Va., it is operated down the hill at a slower speed, approximately 15 m.p.h. regenerating. This allows the slack in the train to accumulate and bunch against the locomotive. Under such operation it is an easy matter to stop the train by use of the straight air brakes on the locomotive, regeneration ceasing after dropping below 14 miles per hour. In this way undesirable shocks and surges in the train are materially reduced. If a portion of the train is to be taken to Northfork or beyond, the speed from the last set off point, continuing westbound, is held at approximately 20 to 25 m.p.h. regenerating.

Frequently electric locomotives are used to double-head time freight westbound trains hauled by Mallet locomotives, the latter engines making the entire division run. In this case the electric locomotive is placed ahead of the steam locomotive, regenerating on the grade, holding the Mallet engine and train at approximately 20 to 25 m.p.h.

Under normal operation, there are, approximately, 2,500 tons of westbound loads assembled daily at Flat Top yard from nearby operations. These loads are picked up currently and handled by the electric locomotives in trains of empties, and are handled to the western terminus of the electrification.

Operation with Helper Locomotive

In starting it is customary for the lead locomotive to drop back against the train, bunching the slack against the pusher locomotive. As soon as this bunching of slack is felt at the pusher locomotive the engineman on the pusher begins to apply power, steadily increasing it until he has maximum accelerating current on the motors. The engineman on the lead locomotive, to whom this starting impulse is readily felt, reverses his locomotive and commences to pull. The lead locomotive thus takes up the slack, picking up the train, car by car, until the load has been sufficiently balanced between the lead and the pusher locomotive to accomplish an easy moving off of the train.

The locomotives are equipped with relays, which limit the current applied to the motors during acceleration and the engineman regulates the rheostats so that the current is kept up to this limit.

Approaching a stop signal, the engineman of the lead electric locomotive reduces speed, which results in the load building up on the pusher locomotive, and this is an indication to the engineman on the pusher that the engineman on the lead locomotive desires to stop and acts accordingly, by gradually reducing the power and speed developed by the pusher. In this way the pusher locomotive keeps the train slack bunched, which is in the interest of making a better start.

When the train has reached the summit and begins to descend the grade the load on the lead locomotive gradually decreases as the train passes over the summit. When approximately half of the train is over the summit the speed gradually increases until it reaches about 15 m.p.h., when regeneration comes into action. The uncoupling lever between the caboose and the pusher locomotive has by this time been lifted and as the train passes over the crest of the grade it leaves the pusher. The pusher drops back, crosses over to the westbound track and returns to the foot of the grade.

Under certain conditions, when the rails are wet and slippery, it is sometimes the practice to bring the air brakes into action while the locomotive is still braking by regeneration. When this occurs, the engineman makes a reduction of approximately 5 lb. in brake pipe pressure, which applies the brakes on the train, at the same time keeping them released on the locomotive.

Baltimore & Ohio Railroad

That portion of the Baltimore & Ohio Railroad which is electrified lies within the city limits of Baltimore and is a part of the so-called Belt Line, extending from Camden Station on the west to Waverly interlocking tower on the east, a distance of 3.75 miles. There are eight tunnels in this zone, together amounting to 48 per cent of the total distance, the longest tunnel, which is between Camden Station and Mount Royal Station, being 7,300 ft. in length. This part of the zone through which trains are handled by electric locomotives is entirely on a grade, the difference in elevation amounting to 150 ft. which gives an average through grade of 0.9 per cent, the ruling grade being 1.52 per cent and the maximum curvature 10 deg., 16 minutes.

The electric service in this territory is very similar to steam helper locomotive service, except that the road steam locomotives they might be helping furnish no assistance.

The present maximum rating for freight trains handled over the Belt Line is about 2,650 adjusted tons or approximately 2,300 actual tons, excluding steam locomotive, weighing approximately 255 tons.

The ruling grade in the zone is 1.52 per cent eastbound, while that of the remainder of the steam locomotive division to Philadelphia is but 0.8 per cent. This requires the electric locomotives to develop practically twice the tractive effort of the steam locomotives.

The traffic at present consists in the handling of about 33 trains eastbound daily. Of these there are probably seven through passenger trains for the east and one or two locals, the remainder being eastbound freight trains. On special occasions a considerably greater number of eastbound trains are handled within a 24-hour period.

A.S.T.M. Holds Annual Meeting

Preservation of Timber, Corrosion of Iron and Steel, Varnishes and Insulating Materials and Concrete Were Among Topics of Interest to Electric Railway Men

THE American Society for Testing Materials held its twenty-seventh annual meeting at the Chalfonte-Haddon Hall, Atlantic City, N. J., June 24-27. The total registration this year was 758, which was slightly less than last year. The following officers were elected: President, F. M. Farmer, chief engineer Electrical Testing Laboratories, New York, N. Y. Vice-President, J. H. Gibboney, chemist Norfolk & Western Railroad, Roanoke, Va. Members of Executive Committee, William Campbell, A. E. Jury, Anson Marston and J. A. Mathews.

Report on Timber

The committee on timber had continued its investigations during the past year, which were conducted under the auspices of the Central Committee on Lumber Standards. In reviewing the recommendations made at the Washington conference, these were indorsed as marking material progress in standardization. The committee proposes to use some of the basic principles agreed on in connection with future developments in proposing standard specifications for timbers.

The report of the sub-committee on timber preservatives included a proposed tentative method of chemical analysis of zinc chloride and a revision of the standard methods of sampling and analysis of creosote oil. This latter revision involves the float test of residue, a revision of the specifications for distillation thermometers in accordance with the recommendations of committee on thermometers and another regarding distillation vessels for creosote oil and other high boiling materials.

The sub-committee on methods of testing wood has been considering revision of the tentative method of testing small clear specimens of timber and the preparation of a new procedure for conducting static tests of timber in structural sizes.

Corrosion of Iron and Steel

The sub-committee on inspection of the Fort Sheridan, Pittsburgh, and Annapolis tests reported additional failures at Fort Sheridan among the non-copper bearing groups of sheets, with no failures in any of the copper-bearing groups. The first failures at Annapolis were recorded at the October, 1923, inspection, the sheets failing being in the same non-copper bearing groups as failed first at Pittsburgh and at Fort Sheridan.

The sub-committee on total submersion tests reported the failure of all of the light gage sheets at the Washington location and about 60 per cent of the light-gage sheets at Annapolis. A comparison of the failures in the light-gage sheets in the Calumet mine test completed in 1921, and the corresponding groups of sheets in the Washington test show the average life of the sheets immersed in water from the

city of Washington supply to be about eighteen and a half times longer than the corresponding sheets immersed in mine water. The tests thus far do not indicate any outstanding superiority for any one type of metal, and the presence of copper added to the various types of metal does not increase its resistance to corrosion, when the samples are totally and continually submerged in running water of acid or alkaline reaction.

The sub-committee on tests of metallic coatings reported plans for conducting comprehensive exposure tests on metallic products, coated by eight recognized commercial processes. The tests are to be located at four different points representing as many various conditions.

Preservative Coatings for Structural Materials

The committee on preservative coatings for structural materials reported that a new sub-committee on shellac has been formed. The sub-committee on linseed oil has carried out a considerable amount of experimental work during the past year, but has not as yet proposed any standard recommendation. Tentative methods of routine analysis of titanium pigments and a tentative method of tests for coarse particles in paint pigments were recommended. The sub-committee on methods of testing varnish also recommended that the tentative method of testing oleo-resinous varnishes be advanced to a standard. Specifications for lithopone, lamp black, bone black, chrome yellow and chrome green were proposed for consideration.

Electrical Insulating Materials

In addition to a further study of existing standards and tentative standards, the committee on electrical insulating materials has formulated additional methods and investigations for various phases of the general subject of insulation. A proposed method of testing sheet and tape insulating materials for dielectric strength was included in the report and also a method for testing untreated insulating paper.

Petroleum Products and Lubricants

The committee on petroleum products and lubricants recommended certain revisions in methods of testing grease and the viscosity of petroleum products and lubricants. Revision in methods of testing gasoline, naphtha, kerosene and similar products consisted of changes in the specifications for the high distillation thermometers.

Concrete

A paper by Cloyd M. Chapman gave results of an investigation conducted by Dwight P. Robinson & Company into the causes of cracking of the wearing surface of concrete floors. The cracking appears to be due to unusual contraction of the top coat. Shrinkage tests on mortar and concrete specimens showed that the aggregate used in 1:2 mortar and 1:2:4 concrete may exert a decided influence upon the amount of shrinkage which takes place when the mortar or concrete hardens and dries out. A paper by Duff A. Abrams on the use of calcium chloride in concrete for attaining rapid set and early strength gave the results of some investigations. The conclusion reached was that in the use of calcium chloride no advantage is gained for percentages of the commercial product greater than 2 or 3 per cent, corresponding to a chlorine content of 1 to 1½ per cent. This amount when used in mixes of about 1:5 and in consistencies suitable for building construction showed an increase in strength of from 100 to 200 lb. per square inch. For richer mixtures and drier consistencies the strength increase was greater and for leaner mixtures and wetter concrete it was less.

Manganese Steel

A paper by John H. Hall and G. R. Hanks gave the average composition of manganese steel with brief comments on the proper limits for the different metalloids, together with a brief summary of steel-making methods employed in foundries making manganese steel. A summary was included on the physical properties, such as tension and bending tests, shear, hardness, resistance to wear, heat and electrical conductivity.

Fire Hose Coupling Threads Standardized

THE American Engineering Standards Committee announces approval of American national screw threads for fire hose couplings. This standard was submitted under the leadership of the National Board of Fire Underwriters, the National Fire Protection Association, the American Society of Mechanical Engineers and the American Water Works Association. It marks for the first time a national agreement on tolerances or limits of accuracy necessary to secure interchangeability in manufacture.

Wisconsin Association Midsummer Meeting

THE date for the midsummer meeting of the railway section of the Wisconsin Utilities Association has been set for Aug. 14 and 15 at the new Lorraine Hotel, Madison.

Mid-West Claim Agents' Association

THE fourth annual convention of the Mid-West Claim Agents' Association will be held at the Hotel Fort Des Moines, Des Moines, Iowa, July 18 and 19. The program follows:

Friday, 10 A. M.

Address of welcome by Honorable Carl M. Garver, Mayor Des Moines, Iowa.

President's address, by Trevor C. Neilson, claim agent, East St. Louis & Suburban Railway.

Report of secretary-treasurer, by O. L. Borgquist, chief clerk claim and legal departments, Kansas City Railways.

"The Rule of Res Gestæ," by Hon. Herman F. Zeuch, judge municipal courts, Des Moines, Iowa.

"Enlisting Co-operation in the Claim Department," by F. G. Kelly, superintendent railway and claim department, Fort Smith Light & Traction Company.

Friday, 2 P. M.

"Damage Claims," by F. W. Stockmar, St. Louis, manager Railway Audit & Inspection Company.

"Suggestions for Relief of Some of the Claim Agents' Problems," by W. E. Robinson, claim agent Cincinnati Traction Company.

"A Co-operation Plan for the Reduction of Accident Cost," by C. B. Proctor, claim agent Memphis Street Railway.

Saturday, 9 A. M.

Paper by F. R. Harrington, claim agent St. Joseph (Mo.) Railway, Light, Heat & Power Company.

"Preparation of Releases," by E. A. Funke, claim agent Lincoln Traction Company.

"Men," by R. S. Mahan, claim agent Kansas City, Clay County & St. Joseph Railway.

Election of officers.

Recent Improvements in Special Trackwork*

By P. Lo Balbo
General Manager Piedmont Steam Tramway Company, Italy

THE topic of special trackwork naturally divides itself into two parts, namely (1) the manufacture of parts and (2) their design.

One of the problems connected with electric railway frogs is means for reducing the blow which occurs when the wheel passes off the point of the frog and before the tread of the wheel reaches a support on the side bearing or wing of the frog. Obviously, with wide tread wheels there would be no trouble of this kind except at right angles or at angles approaching 90 deg. With the narrow tread wheels used on electric cars, however, a flange bearing in the groove is necessary. The Lille-Roubaix-Tourcoing Railway reports the use of some manganese steel frogs in which this flange bearing has kept its form since 1913. In others of similar type owned by the company this flange bearing has worn down, and an attempt has been made to build it up with the electric arc, but this method leaves a rough surface. The only way of smoothing a flange bearing renewed in this way, and thus reduce the noise, is to grind the welded portion with a wheel of the proper shape.

In its built-up Trail special work, the company used in early designs a hardened steel flange bearing held in place by screws, but in later designs these bearings have been put in as inset work.

Replies to the data sheet show that all types of special work are used. In general, preference is given to manganese steel, except for the cost, which seems to be higher than that in America. This has restricted its use considerably, and outside of England and France built-up special work is common.

One of the considerable factors in the cost of this special work is the large variety of patterns used. This suggests that economy can be secured through greater standardization.

This is primarily a question of standardization. The French Railway Association has attempted to establish certain standards and at the meeting on Dec. 20, 1923, the committee on tramways recommended four standard switches, namely, of 20 m., 30 m., 50 m. and 60 m. radii, and three frogs, namely with angles of 10½ deg. 11 deg. and 13 deg. Other standards set have been by the American Railway Association and the American Railway

*Abstract of a report presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, Paris, June 16-21, 1924.

Engineering Association. Standards along this line are greatly to be desired and should not retard progress in the art if they are frequently revised to embody the results of experience and to care for newly developed needs.

Central Association Program

THE program for the Midsummer Meeting of the Central Electric Railway Association, to be held July 17 and 18 at the Breakers, Cedar Point, Ohio, will consist of morning sessions both days, devoted to general subjects, while the afternoon session on July 17 will be under the direction of the Engineering Council. The association dinner will be given the same evening.

There will be a meeting of the executive committee Thursday morning, after which the regular session will begin at 9:30 o'clock, Eastern standard time. Following is the program:

MORNING SESSION, JULY 17, 9:30 A.M.

President's address.
Report of the secretary and treasurer.
Appointment of convention committees.
Committee reports.
"Constructive Publicity and What May Be Accomplished By It," by W. H. Boyce, commercial manager Pittsburgh Railways.
"What Are We Doing to Increase Our Passenger Business," by F. W. Shappert, traffic manager Chicago, North Shore & Milwaukee Electric Railroad.
"What Are We Doing to Increase Our Freight Business," by L. M. Brown, superintendent Interstate Public Service Company.
"What Are We Doing to Increase Our Light and Power Business," by J. C. Matthieu, commercial engineer Dayton Power & Light Company.
"Forestry Conservation," by David L. Goodwill, former chairman forestry policy committee United States Chamber of Commerce.

AFTERNOON SESSION, ENGINEERING COUNCIL, 2 P.M.

"The Purpose, the Opportunities and the Future Possibilities of the Engineering Council," by K. A. Simmon, manager light traction division, Westinghouse Electric & Manufacturing Company.
"A Discussion of Some of the Latest Developments in High-Tension Insulation," by Arthur O. Austin, chief engineer and factory manager Ohio Insulator Company.
"Rolled Steel Wheels," a motion picture. Discussion by Lawford Fry, metallurgical engineer Standard Steel Works Company.
Reports of committees.
General business.

MORNING SESSION, JULY 18, 10 A.M.

"What Does the Interurban Electric Railway Mean to the Economic Development of the Central West," by Joseph A. McGowan, secretary-treasurer Terre Haute, Indianapolis & Eastern Traction Company.
"The Financial Structure of the Electric Transportation Industry," by J. P. Harris, vice-president Union Trust Company, Cleveland, Ohio.

New England Outing

THE annual outing of the New England Street Railway Club will be held this year at Norumbega Park, Auburndale, Mass., on Thursday, July 24. A full program to interest all members of the family has been arranged. Things begin to happen at 10 a.m. and continue all day, ending with a show at the theater in the evening. The afternoon program will include the annual costume baseball game between the street railway men and supply men.

Standardizing Copper Wire

SPECIFICATIONS for copper wire, including hard drawn, medium hard drawn and tinned, soft or annealed wire, have been submitted to the American Engineering Standards Committee by the American Society for Testing Materials. The specifications include requirements for purity of material, diameter, gaging, finish, tensile strength and elongation, specific gravity, electric conductivity, chemical test methods, packing and inspection.

These specifications will be considered by a special committee of representatives of the principal engineering and commercial societies interested in copper wire. The representative of the American Electric Railway Association is G. C. Hecker.

American Association News

Itinerary of Committee on Foreign Operation

THE special committee of the American Association on foreign operation, consisting of Executive Secretary James W. Welsh, President Harley A. Johnson of the Engineering Association and Harry L. Brown, Editor ELECTRIC RAILWAY JOURNAL, sailed from New York, Wednesday, July 9, on the *Aquitania*. The members of the committee expect to arrive in Southampton, England, July 14 or 15. They will make their headquarters at London for approximately two weeks, visiting points of interest in that city and taking short trips out from London to reach the nearby cities. During the first week in August they expect to visit some of the northern cities in Great Britain and Scotland, such as Newcastle, Liverpool, Manchester, Edinburgh and Glasgow. Following this, they will cross the channel to France, and will proceed immediately to Paris. On their arrival at Paris they will visit the various electric railway properties in that city and some of the major steam railroad electrifications in Switzerland, the electrification of the Midi Railway in southern France and the electrification of the Paris-Orleans Railroad. They expect to sail from Cherbourg on the steamship *Berengaria* Aug. 23, which is due to reach New York on Aug. 29.

Entertainment

THE entertainment committee of the American Association held a meeting at association headquarters on July 8 to discuss plans for entertainment at the October convention. Members present were: F. H. Gale, chairman; M. A. Oberlander, George A. Barnes, S. J. Cotsworth, John Craig, George Rowland, L. W. Shugg, George R. Lyman, A. A. Hale, F. L. Butler, Harry L. Brown and J. W. Welsh.

William Graham of J. J. Habermehl Sons, decorators, presented sketches showing a proposed treatment for the balcony spaces and other decorations in the ballroom, so as to harmonize the decorative scheme with the general entertainment features to be provided.

The arrangement of the entertainment features to be provided during the convention was discussed and the following tentative program was laid out: (1) An opening dance or reception to be held in the ballroom Monday night; (2) a general session with special musical features to be followed by dancing, Tuesday night; (3) a carnival with special features and dancing, to be held in the ballroom on Wednesday night; (4) a grand ball to be held in the ballroom on Thursday night.

Mr. Gale was appointed chairman of a sub-committee in charge of the opening dance or reception, and it was agreed that the entire committee would assist him in preparing for this function. Mr. Hale was appointed chairman of a sub-committee to arrange for the carnival and for special features for the grand ball. Mr. Craig was appointed to assist Mr. Hale in this work. Mr. Cotsworth was appointed chairman of a sub-committee in charge of music and Mr. Barnes of a sub-committee to arrange for golf.

The sub-committee to make arrangements for the grand ball will be headed by Mr. Palmer, while John A. Dewhurst will head a sub-committee to provide for entertainment features for the ladies.

Special Reports Available

THE Bureau of Information and Service of the American Electric Railway Association has prepared the following reports, which are available to member companies in good standing upon request:

Traffic Ratios, Part II: Interurban Lines.—About 125 interurban companies are included and there is shown for each company the average speed, revenue passengers per car mile, per mile of track and per car operated, operating ratio, revenue per mile of track, passengers per car mile, operating income per mile of track and other ratios similar to those given for the city lines in compilation issued June 1.

Attitude of State Regulatory Commissions Toward Motor Bus Competition with Railways.—This is a revision of the compilation of the same name issued Sept. 1, 1923, in which a number of changes have been made in the light of recent decisions in the development of the regulation of motor vehicles. It comprises a study of the development of the policies of the various state commissions in regard to the issuance of certificates of public convenience and necessity to motor bus operators.

Trend or Material Prices.—New edition of the association's compilation bringing down to date the trend of prices of materials used by electric railways as furnished by manufacturers.

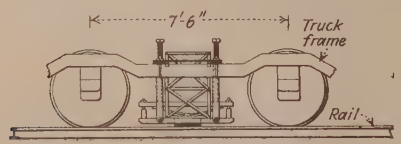
Motor Bus Operating Reports.—Gives figures on results of operation by different companies including the Washington Rapid Transit Company in Washington, D. C., the Sheffield Corporation Tramways, England, and others.

In addition to the above supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies have been prepared, bringing them down to date.

Maintenance of Equipment

Scrubber Keeps Rails Smooth

AN UNUSUAL method of removing rail corrugation and of smoothing down new rail joints has been developed by J. H. Haylow, chief engineer of the Memphis Street Railway, Memphis, Tenn. Carborundum bricks mounted on springs attached to the truck frames of a railway car press against the rails.



Machine Used at Memphis for Smoothing Corrugated Rail

Corrugations are removed by operating the car back and forth over the rough spots.

This apparatus, the general appearance of which is shown in an accompanying illustration, is mounted on a single-truck work car equipped with a Brill 21-E truck and two GE-57 motors. Two flat steel bars 1 in. x 5½ in. extend across the top of the truck frame. Pressure adjusting screws of 1½-in. diameter pass through threaded holes in these bars. The adjusting screw at its lower end bears against a flat steel bar which, by means of a standard 21-E truck spring in turn bears upon the carborundum brick.

The carborundum bricks are 2½ in. x 3 in. x 12 in. and are held in U-shape frames. Pipe spacers allowing 1-in. play separate the frame which holds the brick from the bar against which the spring presses. Bolts with lock nuts are used to adjust the brick over the rail. A stiffening framework made of flat steel strips is used to give the apparatus rigidity.

The carborundum bricks bearing against the rail grind it down to a smooth surface. This work puts the motors of the car under a considerable strain, but inasmuch as the car is not used for other purposes it is felt that there is no objection to the practice. The machine is used at night when no other cars are passing over the track to be ground down, and has proved to be efficient and rapid in the performance of this kind of work.

Detroit Develops Truck for Arc Welding

TRACK welding and bonding on the municipal railway in Detroit is under the jurisdiction of the electrical department, and this department has recently put into service a welding outfit consisting of a welding unit mounted on a gasoline truck.

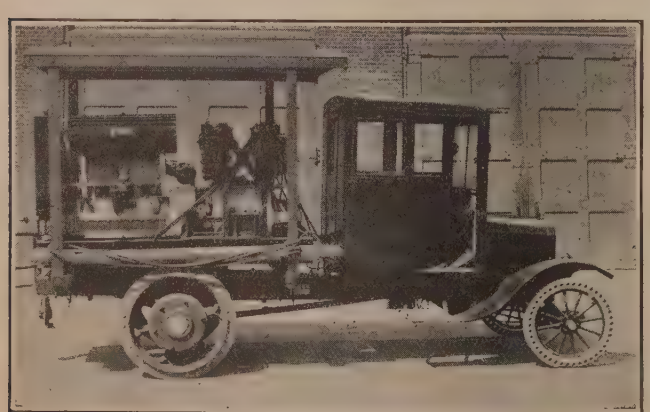
The truck includes a Ford 1-ton chassis, equipped with a Field closed cab and an Olson 2-ton unit, with an Olson No. 8 frame extension, steel wheels, special bearings and 16-leaf rear springs. The front tires are 30x3½ in. wide base Lambert, and in the rear, 34x6 in. Goodyear all-weather tread cushion tires are used. The accessories include a Stewart speedometer, Handy governor, electric lights and electric starter. The welding unit is a Wilson Welder & Metals Company's two-arc gasoline-driven engine.

This truck carries a crew consisting of two welding operators and a driver-helper. The latter, when the truck is not in motion, prepares and cleans the track joints for the operators, tends the welding equipment, serves the operators with welding wire and does any other miscellaneous work required with an outfit of this character.

It is anticipated that an extra light-weight reciprocating grinder (if such an article can be procured) will be added to the truck in order that the welding and essential grinding may be done by the same crew, thereby eliminating the expense and inefficiency incident to the welding being done by one crew and the grinding by another.

The electrical department is also developing a bond-testing car, such as is in use on other properties, for determining the electrical condition of rail joints. At present, joints are tested by means of a portable meter, it requiring approximately one year to test all the joints on the system. It is estimated that a bond-testing car can do the same amount of work in approximately one month. With the bond-testing car, a graphical record of the conductivity of each joint is automatically procured, and the location of defective joints spotted on the pavement by means of a paint gun attached to the car.

As a further check on welded track



Detroit Welding Truck with Canopy Up

Detroit Welding Truck with Canopy Down

joints both before and after the same are placed in service, the electrical department is investigating the field application of magnetic analysis, making use of either the defectoscope or the magnetoscope. Both of these instruments are described in the May, 1924, issue of the *Scientific American*. Welds which may pass a visual inspection may be defective. It is believed that any instrument which will determine, without testing to destruction, the condition of a weld will certainly pay for itself many times over. If either or both of these instruments can be used for the purpose cited, it is contemplated to place them on the bond-testing car.

The checking of rail grinding at track joints is another matter being given consideration, with particular reference to the use of an automatic indicator which will take the place of the usual straight edge. The latter instrument has its limitations, particularly in paved streets, because to determine the exact conditions it is almost necessary for the person using it to stand on his head. The automatic indicator will make unnecessary any such gymnastic convolutions and will, at the same time, give a true reflection of the conditions.

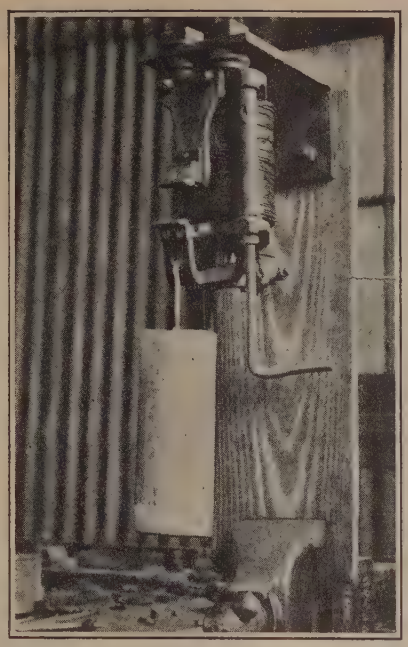
Practical Method for Testing Magnet Coils

MAGNET coils used in railway control apparatus are given a physical test in the Decatur shops of the Illinois Traction System to determine their fitness for service. This amounts to testing the coil under service conditions to determine if its pull is sufficient to operate the control mechanism. Such a test is used in preference to the electrical test because it is more simple and can be made more rapidly.

The coil is mounted in the usual bracket with the hinged armature attached. The bracket is bolted to an iron member which is mounted on a board held vertically in a bench vise during the test.

With the coil in position a 24-lb. weight is hung on the contact tip end of the armature. A specified current is sent through the coil and if the weight is raised so that the lower contact is brought up against the stationary contact the coil is considered all right for service. Otherwise it is marked B.O. and is rewound.

To facilitate the placing of a coil



Testing Magnet Coils in the Decatur Shops of the Illinois Traction System. The Magnet Is Expected to Raise a 24-Lb. Weight

in the bracket the usual retaining nuts on the connecting bolts have been replaced by nuts having an extension with a handle at the end. These, as well as other details of the arrangement, are shown in the accompanying illustration. Since the use of this device was inaugurated the company has experienced no failures attributable to faulty testing of magnet coils.

Framing Parts in Stock Speeds Repairs

IN THE shops of the Omaha & Council Bluffs Street Railway a complete stock of framing parts is carried to speed up the work of repairing damaged cars. These parts include front vestibule framing, posts, sash, doors and other pieces most frequently damaged in service.

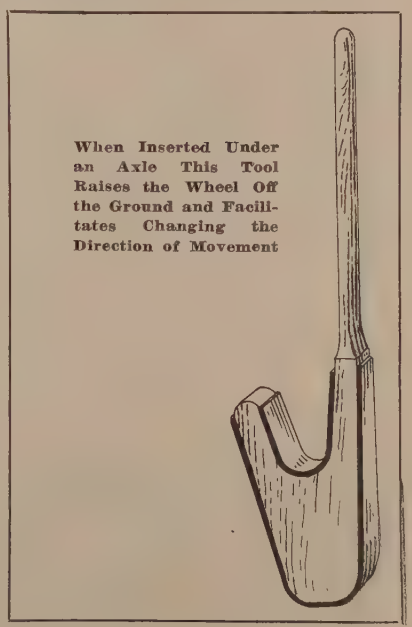
The practice for a number of years has been to keep the number of different designs of cars to a minimum, so as to reduce the number of different types of these repair parts that have to be carried.

All parts are finished and primed before being put into stock. In this way the amount of time necessary to make a repair on a damaged car is kept to a minimum. Convenient storage racks are arranged so that the stocks of repair parts are stored in an orderly manner, making them easily accessible when required.

The reduction in the time that a car must be held in the shop for making repairs, results in a material saving by keeping cars in service instead of in the repair shop. In addition, the cost of manufacturing repair parts is reduced because they are made in comparatively large lots, instead of being made up as special jobs in the wood mill each time a car comes in for repair.

Handy Tool for Moving Wheels and Axles

IN MOVING wheels and axles from place to place in the railway repair shop of the Georgia Railway & Power Company, Atlanta, Ga., it is often necessary to turn a sharp corner in changing the direction of movement. A simple handle has been devised to facilitate the turning movement. This consists of a J-shaped piece of wood about 5 ft. in length, with the hook about 24 in. long. Around the bottom a piece of $\frac{3}{16}$-in. iron has been bolted on to provide a substantial wearing surface, and a similar piece has been placed on the inside. The thickness through the base is slightly greater than the diameter of the wheels which are being moved.



When Inserted Under an Axle This Tool Raises the Wheel Off the Ground and Facilitates Changing the Direction of Movement

In using this tool the procedure is to insert it on a slant under the axle and then to straighten up the handle to a vertical position. This raises the one end of the axle so that the wheel is clear of the floor and holds it stationary. Then by pushing on the other end of the axle the set of wheels may be turned through any desired angle.

Lift Facilitates Compressor Removal

ANOTHER use to which air is put in the shops of the Illinois Traction System at Decatur is that of aiding in the removal and replacement of car air compressors. Adjacent to the compressor repair room is a track which leads to the rear of the shop grounds, and it is from a position on this track directly opposite the door opening to the compressor room that the air compressors are removed from the cars.

A short section of the rail nearest the compressor repair room has been arranged so that it can be removed after the car is in position. A platform, which normally rests under the rail, and which carries a small truck made especially for this purpose is raised to receive the compressor. After the compressor has been removed, the platform is lowered so it is even with the lower end of the ramp which leads to the pump room. The truck with the compressor on it is pulled by hand up this ramp, being guided by rails of angle construction. The compressor is removed by means of a chain hoist. A replacement compressor is placed on the truck and the process is reversed.

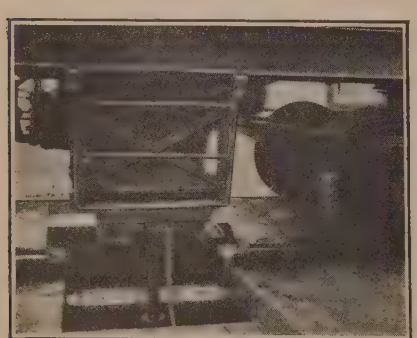
The construction of the apparatus presents a neat appearance of permanent design, being of concrete and steel throughout. Two 10-in. by 12-in. brake cylinders have been bolted together to form the two cylinders of the lift. These are set in the ground at such a depth that the platform will, when lowered into a shallow pit, be below the base of the track rail. The cylinders are spaced an equal distance on each side of the rail, approximately 24 in. center to center. Suitable underground air pipe connections have been made between the cylinders and the pump room where the control valves are located.

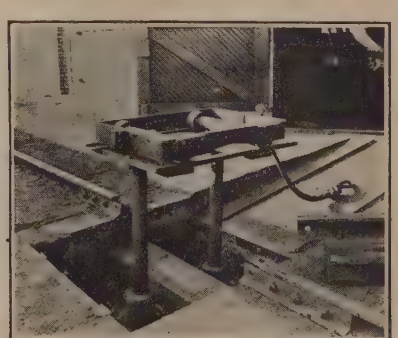
The short section of rail, which is approximately 3 ft. long, is supported at the ends by the concrete wall surrounding the pit and also by means of a short piece of timber, attached to the rail, which rests upon a concrete beam located directly under the rail. The wood timber or tie has been cut away on the underside to allow room for the platform when it is lowered. The base of the rail has been cut away at each end of the short section, the web fitting between fish plates fastened to the adjoining section of fixed rail. A single hole, through the fish plate and web of the rail, permits a bolt to be inserted to insure a secure fastening of the removable piece of track when elevating platform is not in use.

The platform, mounted on the ends of the piston rods of the cylinders, is made up of two steel members 6 in. wide by 1 in. thick and 24 in. long. One of these has been mounted on the end of each piston rod while the two have been connected at each end by means of a channel member which serves as a guide and track for the small truck.

The truck is of low frame, heavy construction, the side sills being bolted together at the ends to form the end sills. Small wide tread wheels, inside mounted on heavy axles, do not rise above the top of the side frame. This truck is 24 in. wide and 30 in. long. At one end a handle has been provided to which a rope is attached to facilitate pulling. Angles have been embedded in a concrete ramp which has a rise of approximately 5 in. and serves to guide the truck as it is being pulled into the compressor room.

With shop air pressure of approximately 100 lb. this device has a lifting power of 15,000 lb.





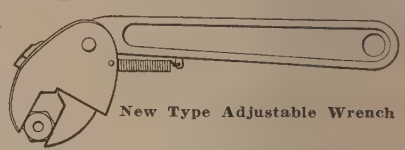
Left—Air Compressors Are Removed from Cars at Decatur Shops of Illinois Traction System by Means of an Air-Operated Lift Having a Capacity of Approximately 15,000 Lb. Right—Two 10-In. x 12-In. Cylinders Bolted Together Form the Lift. Small Truck Carries Compressor Into Pump Shop

New Equipment Available

Automatic Adjustable Wrench

A NEW type of wrench shown in the accompanying illustration is being marketed by the Speednut Wrench Corporation, Chicago, Ill. The wrench proper consist of three forged steel parts, which include the two jaws and the handle. A spring is furnished to aid in keeping the jaws in constant adjustment. The wrench, however, works without the spring, which is designed so that it can be easily detached or attached as required.

The wrenches are made in two sizes; the 8-in. size takes nuts from



New Type Adjustable Wrench

$\frac{5}{16}$ in. to $\frac{3}{4}$ in. and the 6-in. size nuts ranging from $\frac{1}{8}$ to $\frac{7}{16}$ in. Both sizes are arranged with ratchet for opening and closing the jaws. This wrench construction provides for a tight fit regardless of the worn condition of a nut.

New Machine Tool Controllers

A NEW line of magnetic machine tool controllers has been placed on the market by the General Electric Company, Schenectady, N. Y. They employ the counter-emf. method of acceleration and are applicable to both reversing and non-reversing, constant and adjustable speed drives. They have been developed primarily for application to direct-current motors in sizes ranging up to and including 15 hp.

The controller provides two accelerating points; the starting resistor is automatically short-circuited in one step upon proper acceleration of the motor. This is accomplished by an accelerating contactor whose closing is governed by the counter-emf. of the motor.

A complete redesign has been made of the same company's larger types of magnetic machine tool and general purpose controllers.

The News of the Industry

Applications for Bus Permits Renewed in Buffalo

Another definite step has been taken by the International Bus Corporation, a subsidiary of the International Railway, and the VanDyke Motor Car Company to establish bus service in Buffalo, N. Y. Their previous applications were rejected by the City Council. After the filing of the new requests Mayor Schwab set July 18 as the date for a public hearing for permits to operate in Delaware Avenue and Delavan Avenue.

The International Bus Corporation would establish a fleet of double and single-deck buses to operate on a 10-cent fare with a 3-cent charge for transfers to a connecting trolley line and a 6-cent charge for a transfer from a trolley to a bus line. The trolley fare is 7 cents or four tokens for 25 cents. Under the proposal of this company the city would be empowered to take over the lines on July 1, 1934, or on July 1 in any year thereafter on six months' notice at the value of the physical property.

The VanDyke company proposes to operate on five city routes covering widely separated parts of the city. It agrees to pay the city 3 per cent of its gross receipts and to operate thirty buses each with a carrying capacity of sixty passengers on a 10-cent fare with free transfers to connecting bus lines.

The consent of the Public Service Commission must be obtained in addition to that of the City Council if either line is to operate.

Of interest in this connection is the opinion of Corporation Counsel Frederick C. Rupp handed down at the request of the City Council in which he holds the city cannot operate municipal bus lines in the streets or on parkways that are approaches to parks. Notwithstanding the opinion, City Commissioner Frank C. Perkins, the Socialist member of the board, insists that the city buy and operate fifty buses at a cost of $300,000 or more to be used as the basis of a larger fleet of municipal buses to serve all sections of the city. The resolution of Commissioner Perkins was defeated, but it is expected that it will be considered at some future time by the City Council.

Restraining Order Issued Against Atlantic City Union

An order has been issued by Vice-Chancellor Ingersoll prohibiting striking motormen and conductors of the Atlantic City & Shore Railway, Atlantic City, N. J., "from interfering in any way" with the operation of cars. The order prevents the strikers from picketing street corners, endeavoring either verbally or by cards and signs to persuade persons not to board the trolleys, and interfering with those operating the cars. For some time now the company has been operating cars on normal schedule, but the strikers have picketed every corner, displaying cards and signs, calling attention to the strike and suggesting that the trolleys be boycotted. Mayor Bader has placed an official ban on a move by strikers to disrupt railway service by running free buses.

Mayor Dever Talks Transit

Chicago Executive Sees Need for Co-ordination of Elevated, Subway, Surface and Bus Lines

Immediate action on the many Council resolutions urging construction of subways in Chicago forthwith will be demanded in another resolution to be presented to the City Council at its meeting on July 15, according to a statement made by Alderman Thomas J. Fowler, upon his return from New York City.

The New York subway has been the particular interest of the many city officials, including Mayor Dever, who have been attending the Democratic convention. Within two days two different correspondents, one of the Chicago *Tribune* and another of the Chicago *Journal*, quoted the Mayor as having said that in his opinion street cars were "practically obsolete."

Then, two days later, the *Tribune* had wired an extensive interview with the Mayor. Mr. Dever dictated the statement, which he declared was the first time he had definitely talked about Chicago's transportation problem. Just now Chicago's Aldermen are trying to reconcile the second interview with the first. The *Tribune* quoted the Mayor as follows:

No one who has given much thought to Chicago's transportation problem will argue that we may be able to dispense with the surface lines in the near future. The fact is the bus furnishes us with a new and desirable unit of service and is a factor which should not be lost sight of when we are dealing with the traction problem.

Fundamentally a sound solution of the traction question must provide for rapid transit service through the Loop and radiating to all sections of the city. This necessarily includes the building of subways and the use of them in conjunction with the elevated lines, and, in some measure, by the surface lines. The proper development of a new rapid transit system will, in my judgment, include the building of subways and the use thereof by the elevated lines and the surface lines in such manner and to such a degree as good engineering may dictate. But it will also include the wide and increasing use of the bus.

May I repeat that I do not believe that the bus is adapted to eliminate our surface lines, which are now carrying approximately 80 per cent of the total passenger traffic of our city? The surface lines are a very important factor in our local transportation service and they will continue to be so for years.

When the four units of service—elevated lines, subways, surface lines and buses—are properly correlated and unified Chicago will then have a system adequate to its needs.

In proposals made by the city to purchase the Surface Lines we are trying to keep all these facts in mind. Our purpose is to acquire these properties at a fair price. That is to say, at such a price as will enable us, when the city takes them over, to operate them with a reasonable hope that good service may be given to the people and the lines unified and extended, thereby taking the traction question out of our local politics.

Let us not befool ourselves. Roughly, the Surface Lines in Chicago today carry 800,000,000 passengers a year. The motor buses and the elevated carry 200,000,000 a year. Hence the folly of saying—which I have never said—that the Surface Lines can soon be eliminated from congested areas. But it is also true that only in their wide transformation and their thorough unification do they contain a useful and convenient future for us. Also we must always keep in mind the high desirability of the bus as a unit of service.

Planning Interurban Extension

Schedules for two through limited interurban passenger trains a day each way between Indianapolis and South Bend, Ind., are being worked out by the Winona Service Company in conjunction with the Union Traction Company and the Chicago, South Bend & Northern Indiana Railway. These trains would stop only at county seats. At the same time plans are under way for a further development of the interurban freight business. It is not proposed to run passenger cars through from Louisville to South Bend. There would be close connections and a change at Indianapolis. The proposed limited trains from Indianapolis to South Bend would run over the Union Traction lines to Peru, over the Winona Service lines from Peru to Goshen and over the Chicago, South Bend & Northern Indiana from Goshen to South Bend. This plan has been developed since Harry Reid, president of the Interstate, and James P. Goodrich, former Governor of Indiana, acquired the Winona line.

Hearing Ends on Plea for Fare Increase in Niagara Falls

Hearings have been closed by Public Service Commissioner Pooley on the application of the International Railway, Buffalo, N. Y., to abandon its Sugar Street line in Niagara Falls and to increase the fare there from 5 to 7 cents, with four tokens for 25 cents, the same rate as charged by the International Railway in Buffalo. The commissioner indicated he would recommend abandonment of the Sugar Street line, but would not favor a fare increase in Niagara Falls at this time. Testimony was introduced by the railway to show it sustained an annual loss of $34,000 by operating the Sugar Street line. The commissioner indicated that if a higher rate of fare was granted the International in Niagara Falls he would be inclined to deny the abandonment petition on the ground that other lines in the city could carry the losses sustained through the operation of the Sugar Street route.

Slight Advance in Eastern Massachusetts Pay

An agreement which carries a slight advance in wages for 1924 has been entered into between the Eastern Massachusetts Street Railway and the carmen's union. The advance is so slight, however, as to be almost negligible. The basic rates of 58 cents an hour for the men on two-man cars and 63 cents an hour for the operators of one-man cars will remain undisturbed, but the change will come in the computation of compensation for excess time. The excess time payment will be figured on the basis of the pay the men receive instead of on the basic rate for two-man car operators, as formerly.

Nine hours will constitute a day's work, to be completed within a spread of eleven hours, as at present, and when the men have to work into the twelfth hour in order to finish a nine-hour day they will receive extra compensation of 20 per cent of the straight pay for the extra hour. Inasmuch as the one-man car operators receive 63 cents an hour their extra pay will be figured on the 63 cents basis instead of the 58 cents basis which was used under the old agreement. Operators of two-man cars remain on the same pay basis as before, but only a small percentage of the company's cars today are two-man cars.

Negotiations for a new agreement have been in progress since last May. They were delayed somewhat by the fact that a bill was before the Massachusetts Legislature to establish a shorter day for the carmen. The Legislature did not pass the proposed legislation and negotiations were resumed.

Wage Agreement at Three-Cent Advance at Montreal

The employees of the Montreal Tramways, Montreal, Que., unanimously accepted the offer of the company on June 17 for a wage agreement which will be effective for a period of three years. The decision affects 3,500 men. The proposal submitted by the company to the men provides for a general increase of 3 cents an hour to the present rate and an additional 5 cents an hour for Sunday work and holidays. These proposals were contingent upon the signing of an agreement for a period of three years from July 1, 1924. It was expected on July 4 that an agreement on this basis would be signed in a few days.

The present rates for trainmen are: First year, 39½ cents an hour; second year, 44 cents an hour; after two years, maximum rate of 48 cents an hour. Certain classes engaged in freight and other special services are paid at the rate of 5 cents an hour additional. The proposed increase applies to all employees, conductors, motormen, carhouse men and shopmen. It was agreed that regulations regarding working conditions should be discussed and arranged following the ratification of the three-year agreement.

For several years the men at Montreal have been interested in having a pension fund established. After several months work the management submitted a plan providing for life insurance up to $2,000, sickness and injury benefits of half-time for a period of twenty-six weeks and old age pension of $50 a month at the age of sixty-five years, after twenty years of service. A vote was taken on this by the members of the union and as the majority of those in attendance were men of comparatively short terms of service with the company the proposal was voted down.

Six-Day Week Voted by Boston Men

Preparatory to the formal arbitration of wages and working conditions the carmen in the employ of the Boston Elevated Railway have voted to introduce a six-day week on the system. The union voted on this issue after a series of conferences between the officers of the union and trustees of the company. The vote was taken on this question:

Do you favor changing to a six-day work week, with the knowledge that the question of wages is to be arbitrated?

The vote in the affirmative was 2,857 to 590.

Wage Agreement on Michigan Electric Railway Renewed

Agreements were signed on July 2 with the various employees' associations by which the Michigan Electric Railway, Jackson, Mich., is to pay the same wage to conductors, motormen and other car operators that was in effect on the properties previous to June 1, 1924. This is a two-year agreement. Under the new agreement the rates in cents per hour are to be as follows:

INTERURBAN CONDUCTORS AND MOTORMEN

First six months of continuous service	49½
Thereafter	54½

OPERATORS OF ONE-MAN CITY CARS

First year of continuous service	49½
Thereafter	52½

CONDUCTORS AND MOTORMEN OF TWO-MAN CITY CARS

First year of continuous service	44½
Thereafter	47½

Five cents additional an hour will be paid for all work in excess of regular scheduled runs.

With respect to the rates for interurban conductors and motormen on the Michigan Railroad and the Grand Rapids, Holland & Chicago Railway the same rates will be in effect for them as on the Michigan Electric Railway.

Recess Committees to Consider Railway Problems

Two legislative recess committees have been appointed under authority of the Massachusetts Legislature of 1923-24. One is charged with the duty of studying the various problems relating to the control, supervision and regulation of motor vehicles, which takes in jitneys. The other is to consider the methods of financing additions, extensions and improvements of the Boston Elevated and also the question of terminating the public control of the Elevated.

City Insists Upon Service Guarantee

The announced intention of the Janesville Traction Company, Janesville, Wis., to replace service on Washington Street with bus operation as a measure of economy, reached a climax on July 1 when the company sought to make the announcement a reality. This it was prevented from doing by the paving company now engaged in improving the street. The railway is confronted with the problem of taking out its rails, continuing the line by agreeing to stand the cost of paving or establishing bus service. Meanwhile the city demands a written guarantee regarding the character of the new service. A conference between city and railway officials, held to try to reach an agreement, resulted in a deadlock. The matter was then carried to the Railroad Commission.

Members of Crew Involved in Indiana Wreck Are Indicted

Frank J. Nolen, motorman on the Indiana Service Corporation's special car, one of the cars in the wreck at Roanoke, Ind., on May 19, in which six persons were killed, has been arrested on indictments charging involuntary manslaughter, returned at Huntington, Ind. A similar indictment against Leonard Gushwa, conductor on the special, will be served, it was said. The indictment charges that the crew on the special was guilty of negligence because of failure to obey a standing order to keep the track clear for the Wabash Valley Flyer, the other car which figured in the wreck.

New Franchise Sought in Sioux City

The Sioux City Service Company, Sioux City, Ia., has requested the City Council to call a special election for the purpose of submitting a twenty-five year franchise to the voters covering the company's railway lines. The attitude of the company as expressed through W. J. Bertke, vice-president and general manager, is that there is a real demand for railway extensions, and the railway, as a vital public utility, should be encouraged to place itself upon a financial basis sufficiently strong to meet the demand.

In connection with the matter of financing Mr. Bertke has explained that when the Sioux City Gas & Electric Company took over the Sioux City Service Company in November, 1922, it was necessary to sell an additional $1,000,000 of bonds of the Sioux City Gas & Electric Company to pay off the floating debt of the Service company and to provide funds for its immediate requirements. At that time the bankers interested were unwilling to purchase securities of the Service company in the face of poor earnings from railway operation and the fact that franchises were about to expire.

Mr. Bertke believes that a new franchise for the use of the streets for railway purposes should be granted to the Sioux City Service Company for twenty-five years, the statutory limit.

Suggestions Invited in Baltimore

The United Railways & Electric Company, Baltimore, Md., has asked the public to co-operate with it in improving the service. The invitation to make suggestions has been extended by means of large notices displayed in the cars. "Give Us that Idea," the notice is headed, large red type being used. The notice says:

If you have a suggestion which you think would improve the service of the Street Railway System will you please write it down, sign your name and mail it to H. B. Potter, service department, United Railways & Electric Company, 1005 Continental Building.

Supervisors Direct Strangers at Convention

During the recent national convention of the Kiwanis Clubs in Denver, the Denver Tramway furnished some of its oldest and best informed supervisors to the committee in charge of the entertainment of visiting delegates. The supervisors were dressed in the regulation Tramway uniform, and were equipped with badges informing strangers that they would be glad to furnish any desired information regarding Denver. They were stationed in information booths in the Union Passenger Station, at General Registration Headquarters, in the lobbies of some of the principal hotels and at other strategic locations.

In addition all trainmen in service on the cars of the company were equipped with badges bearing the words "Ask Me" in large letters. This helped to indicate to the visitors and residents of the city as well that the company was more than willing to share in making the convention a success.

Interborough Extends Wage Agreement

The Interborough Rapid Transit Company, New York, N. Y., after numerous conferences with representatives of the Brotherhood of Interborough Employees, has agreed to continue the existing wage contract for another year, commencing July 1. Frank Hedley, president and general manager, has arranged to continue the conferences so as to consider minor adjustments. Matters are proceeding amicably.

Chicago Rerouting Plan Appears to Be Endangered

The city of Chicago's elaborate rerouting plan, worked out with the cooperation of Maj. R. F. Kelker of the City Council's transportation committee and the Chicago Surface Lines, appears to be endangered at an important point through the necessity of obtaining frontage consent for the construction of 400 ft. of single line track.

An appeal to the board of directors of the Chicago & Western Indiana Railroad, owners of the property past which the track is to be constructed is to be made by the city.

The proposed 400 ft. of track is essential to the rerouting of the Archer, Ashland and Racine lines and incidentally, of course, the whole plan is involved. In the rerouting plan, the cars coming north are to turn from State Street via Polk Street to Dearborn Street. The link from Dearborn to State has not been constructed.

Legally, the company or the city has no redress in the event of a definite refusal. The railroad owns all the frontage on one side of the street and sufficient on the other side to give it a clear majority.

Detroit Wage Matter Still Before Courts

Important developments have transpired in the wage dispute between the street car men's union and the Detroit Department of Street Railway. Among them is included the granting by the Michigan Supreme Court of a motion of Clarence E. Wilcox on behalf of the Street Railway Commission for a review of Judge Richter's decision which would compel the Detroit Street Railway to arbitrate the wage demands with the employees. On the other hand, union officials have tried to stop the city's appeal to the higher court, through conferences with acting Mayor Joseph A. Martin. Although no details were given out as to what transpired at either of the conferences with the acting Mayor, the union officials are said to have sought to withdraw.

The street railway commissioners have have been determined in their stand that they would not arbitrate with the union under any consideration and that there would be no arbitration with the union even though a new agreement for a basis of arbitration be sought, at least not until such action is ordered by the higher court. It was reiterated that the men have their own association within their ranks which is considered as conclusive proof that the men can secure justice and fair play.

Mr. Wilcox in contesting the mandamus writ ordered by the Circuit Judge argued that the union and not the employees of the department brought the mandamus proceedings; that neither of the two petitioners for the mandamus is a Detroit Street Railway employe; that Michigan laws do not require arbitration; that the arbitration provision of the charter of the City of Detroit violates the provisions of the Federal Constitution because of its indefinite term of procedure.

Preceding the conferences between union officials and acting Mayor Martin it was announced that the Detroit United Railway platform men had renewed their pay pact with the company for one year with no change of schedule. The agreement is between the railway and Division 26 of the Amalgamated Association. The wage scale was announced as follows: 61 cents an hour for beginners; 64 cents an hour after three months and 66 cents an hour after one year with 5 cents an hour extra in all cases for operators of one-man cars. The one change in the agreement it was announced, provides specifically that the business agent shall be an employee of the railway.

The wage scale which the men are now asking from the city on the municipal lines would give the men 72, 76 and 80 cents an hour. Officials of the Municipal system see no reason why the city should pay a higher rate than prevails on interurban lines operating in the city, where for twenty years the same wage scale has prevailed both.

News Notes

New Bus Line Running in Baltimore.—A new bus line connecting the northeastern and southeastern sections of Baltimore has been put into operation by the United Railways & Electric Company. The line was ordered established by the Maryland Public Service Commission at the same time the company was granted an increase in fare from 7 to 7½ cents. The same fare as is charged on the cars is in effect and transfers are issued. The buses are of the 24-passenger type.

Nebraska Road Increases Fares.—The State Railway Commission of Nebraska has consented to a test of a new rate on the Omaha & Southern Interurban Railway between Omaha and Fort Crook that is an increase of 3¾ cents over the present 15-cent fare. The railway had started an injunction suit to restrain the commission while it charged more than the passenger fare of 2 cents a mile provided by state law. The steam railroads have been charging 3.6 cents for several years under a federal court order, but the interurban was still doing business on the 2-cent basis. The company operates in three zones. The road is only 7.8 miles long.

Buses for Private Hire.—Two twenty-seven passenger buses to be used for private hire work have been delivered to the Eastern Massachusetts Street Railway, Boston. They are of the street-car type mounted on White chassis.

Safety Contests at New Orleans.—The membership of the five carhouses embracing the railway system of the New Orleans Public Service Inc., engaged in a friendly contest during June to see which of the lines could operate during the month with the fewest number of mishaps and accidents. The membership of the Prytania carhouse made the best record. In consequence the conductors and motormen of the lines operated there are wearing on the lapels of their coats strips of silk ribbon bearing the inscription "Winner." The captains of the various lines operated from the Prytania carhouse were presented handsome floral gifts by the officers of the company and by Paul H. Maloney, Commissioner of Public Utilities. The winning carhouse also was awarded a pennant which it will display there during the time that the similar contest is underway for July.

More Bus Rights Sought by Public Service.—The Public Service Railway, Newark, N. J., has applied to the Board of Public Utility Commissioners for permission to replace the Crosstown and Fifth-Broadway lines, Camden, N. J., with a bus line. The corporation has also asked for a formal permit for the new Fairview line, operating in Camden. The commission has granted permission to the railway to abandon trolley service on the North Cramer Hill line, Camden, and to use buses exclusively in serving that territory. There was no objection on the part of the city to the abandonment.

Railway Objects to One-Way Street.—The Louisville Railway was one of the number of concerns represented at a hearing before the City Council on July 1, regarding an ordinance for making Fourth Street a one-way street for traffic. Samuel Riddle, vice-president of the railway, opposed the plan. He argued for better regulation of traffic. He said that of the 67,000,000 passengers hauled by the company in 1923, 10,000,000 were hauled on Fourth Street. One way traffic on Fourth Street would make it necessary to build two or three blocks of track, and put in costly turns, etc. The one-way plan is backed by Fifth Street realty interests anxious to increase travel to Fifth Street to the benefit of their realty holdings.

Discloses Bus Plan.—The Third Avenue Railway System's plan for bus service in Yonkers, N. Y., will be presented to the Common Council of that city on July 22. The plan is said to propose the substitution of buses for trolleys on three routes in the vicinity of Yonkers, the establishment of a "U" bus route in the city and a suburban line to Bryn Mawr station. A 10-cent fare would be charged with free transfers to and from trolleys. Getty Square is proposed as a terminus for all the bus routes that might be installed.

Buses Replace Trolley on Five-Mile Route.—Buses will soon displace the trolley line operated by the Montoursville Passenger Railway on a 5.5-mile route between Montoursville and Williamsport, Pa. One of three buses to be used on the route has been delivered. Service will begin with the arrival of the two others. Operation will be under the direction of the Lycoming Auto Transit Company, successor to the trolley company, which, by permission of the County Court, has surrendered its charter.

Bill for Six-Day Week Lost.—The bill introduced by John M. Wynn of Shreveport, Caddo Parish, La., providing for a six-day week for all conductors and motormen has failed to pass the Louisiana House, and on motion to reconsider was indefinitely postponed.

Arrest "Bus Queen."—Helen Schultz, "America's Bus Queen," proprietor of the Red Ball Transportation Company, Mason City, Iowa, was arrested recently on information filed by Frank Hanlon, manager of the Mason City & Clear Lake Railroad, on a charge of operating buses without a license. Miss Schultz was running five extra buses to carry a large crowd of holiday-makers from Mason City to Lake resorts. She and eight of her drivers, arrested with her, each provided a $200 bond and were released to appear for hearing on July 11. Miss Schultz contended that she was operating within the statute even though she had been denied permission to operate between Mason City and Clear Lake. Her contention was that she did have a permit for operation from Mason City to Algona.

Bus Line Suggested for Portland.—An offer to start and maintain a bus line from the central portion of Portland, Ore., to and from St. Johns was made by A. E. Jones, president of the St. Johns Community Club, at a recent conference with Franklin T. Griffith, president of the Portland Electric Power Company. In making the offer he stated that in his opinion an 8-cent fare would yield a profit on the amount invested. President Griffith has taken the matter under advisement, it is reported.

Foreigner Impressed with Chicago Operation.—Among the visitors to electric railway properties in this country, is G. A. Hobler, chief engineer of the New South Wales Government Tramways, Australia. Mr. Hobler recently inspected the property of the Chicago Rapid Transit Company. He is interested in manganese rail as it compared in service with open hearth rail. He was impressed with the number of trains operated around the Chicago loop and with the speed attained in handling them.

Bus Grant for San Diego Railway.—A ten-year franchise for the operation of buses on the streets of San Diego, Cal., has been granted the San Diego Electric Railway by the Common Council of that city. The franchise became effective on July 10. It provides for a tax of 2 per cent on the annual receipts from the operation of buses. Indemnity insurance of $5,000 covering the injury or death of one person by a bus, of $10,000 for more than one person and $1,000 for injury of the property of a third party is also provided. Fares, routes and schedules are subject to authorization of the Common Council and can be altered at any time by that body. A majority vote of the electors of the city may also rescind or modify the franchise.

Asks Bus Grant in Boise.—A twenty-year bus franchise has been asked of the Boise, Idaho, Common Council by the Boise Street Car Company for one route in that city starting at the Union Pacific station and extending to Eighth and Idaho Streets. Hourly service from 7 a.m. to 10 p.m. on a maximum fare of 10 cents is proposed.

Ten-Cent Zone Fare Authorized in Maine.—The Public Utilities Commission of Maine on July 2 rendered a decision permitting the Central Maine Power Company to establish a zone fare of 10 cents, with the provision that eleven tickets, each valid for a single fare or some ride, may be purchased for $1, half fare tickets for school children and other special rates being based on a 10-cent fare, on its railway between Warren and Camden, a distance of 21.47 miles. The present zone fare is 7 cents with school tickets on the basis of one-half the regular fare.

One-Man Cars on Jersey City-Newark Line.—One-man cars will be used on the Jersey City-Newark line, of the Public Service Railway operating over the turnpike. The new service will probably be started on July 20.

City Insists Buffalo Company Pave.—Unless the International Railway, Buffalo, acts at once to repair its tracks on more than six local lines and renew the paving between the tracks and one foot on each side, the City Council has threatened to declare the company's franchise on these streets null and void. The improvements would cost upwards of $300,000. The company contends it has not sufficient funds with which to make the necessary improvements and repairs.

Bus Permit Denied in Syracuse.—Passage of an ordinance designed to permit the operation of buses in Syracuse, N. Y., on the Scottholm route by the Syracuse Co-ordinated Bus Line, Inc., subsidiary of the New York State Railways, was defeated in the Common Council on June 30, by one vote. A similar ordinance applying to a route on James Street will be considered in the near future. The railway subsidiary proposes operation on a 7-cent fare with a free transfer privilege. The application of James W. Dillon, an independent operator, for a permit to operate buses over four routes in the city, among them the Scottholm and James Street routes, on a 5-cent fare, is also pending.

Traffic Control System in Rochester.—An automatic control system for the regulation of traffic is being installed on Main Street, Rochester. The traffic will be controlled by means of a system of colored lights, regulated from towers at strategic points. Virtually every trolley line in Rochester traverses or crosses Main Street and the new system is expected to lessen traffic congestion. The New York State Railways co-operated with the city in erecting the electric control towers.

Seven-Cent Fare in Niagara Falls, Ont.—The Canadian National Railways, a government owned system in Canada, increased the fare on the local lines in Niagara Falls, Ont., from 5 to 7 cents, on July 1. The fare on owl cars from 2:30 until 5:30 a.m. is now 15 cents. A special rate for school children has been put into effect giving them a 4-cent fare, with seven tickets for 25 cents. Mayor Newman has protested to officials of the railway against the alleged hasty action in putting the new fare into effect.

Interurban to Use One Man in Off-Peak Hours.—The Erie County Traction Company, which operates from the city line at Buffalo, N. Y., to Gardenville, Orchard Park and Ebenezer, has started one-man service between 9 a.m. and 3 p.m. The company operates five cars and employs twenty-six platform men. It has been losing money. The one-man service during off-peak hours is regarded as essential to cut down expenses. The company formerly was known as the Buffalo Southern Railway.

Fare Hearing Postponed.—The hearing on the petition of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., for permission to increase its fares, set for July 9, has been postponed to July 16 at Albany.

More One-Man Cars in Rochester.—The New York State Railways, Rochester Lines, began one-man car service on July 1 on the Goodman-Emerson line, the second route in the city over which one-man cars are now operated. A new schedule calling for more frequent service marked the installation of the new type of equipment. The cars used in the one-man service were rebuilt in the shops here.

Financial and Corporate

Bondholders Buy Road

Seventy-Mile System in New York City Sold—Reorganization Plan Approved by Transit Commission

A purchasers' committee from the New York Railways reorganization committee at noon on July 7 bid $4,086,035 in all for ten parcels of franchises and real estate offered by Nathaniel A. Elsberg as special master appointed in the New York Railways receivership proceedings. Joseph P. Cotton made the bids on each parcel for the committee and Mr. Elsberg announced that, subject to the approval of the United States District Court, they were accepted, there being no other bidders.

Among the franchises and other railroad properties sold were those of various subsidiaries of the New York Railways, including the South Ferry Railroad, the Lexington Avenue & Pavonia Ferry Railroad, the Central Crosstown Railroad, the Chambers & Grand Street Ferry Railroad, the Metropolitan Crosstown Railroad, the Metropolitan Street Railway and the Columbus & Ninth Avenue Railway.

The real estate disposed of consisted of many parcels, all in New York City.

The company operates 75 miles of surface lines in New York City, principally in lower Manhattan. The terms of the plan under which it is intended the reorganization shall be carried out provide for a reduction in total capital liabilities from $91,366,445 to $40,163,622. The details were reviewed in the ELECTRIC RAILWAY JOURNAL for May 17, page 793.

OUTLINE OF COMMISSION'S OPINION

On the recommendation of General John F. O'Ryan, the Transit Commission on July 8 approved the plan of reorganization of the New York Railways submitted to it by the reorganization committee. There will be public representation upon the directorate of the new company. This was recommended by the Transit Commission, although the commission did not possess the power to direct the inclusion of public directors in the board. The number of public directors of the new company is a detail yet to be arranged and will depend upon the manner of constituting the whole directorate.

General O'Ryan, in an opinion approved by the commission, discusses the importance of keeping the present system together as proposed in the reorganization plan, points out that the proposed capitalization of the new company does not exceed the fair value of the property and refers to the certainty that the company will be able to meet its fixed charges.

General O'Ryan says that the principal question is whether the proposed amount of capitalization exceeds the fair value of the property involved. He then reviews the fact that this new capitalization, including all new bonds, undisturbed underlying bonds, and 275,030 shares of no-par value stock, rated at $5 a share, aggregates $40,163,622, instead of the capitalization of $91,566,445 of the New York Railways and its present subsidiaries.

In connection with his discussion of this matter the commissioner says that a number of valuations were put in evidence or are available. These were valuations of the property of the New York Railways and of the properties of the subsidiary companies. It is explained that the question was raised as to the propriety of taking the value of the property owned by the subsidiary companies, which is not to be acquired by the new company, rather than the value of the stock in such companies, which represents the property intended to be acquired; but the commission deemed it unnecessary to express an opinion upon that at this time. It says that the actual original cost was not ascertainable for want of data, but estimates of the original cost were available. Estimates of the cost to reproduce at present-day prices and also at pre-war prices were introduced. In brief they follow:

PRESENTED BY PETITIONERS	
Cost to reproduce at present-day prices	$83,718,000
Cost to reproduce at present-day prices, less cost to recondition	81,718,000
Cost to reproduce at present-day prices, less straight line depreciation	65,546,300
Cost to reproduce at pre-war prices	48,552,200
Cost to reproduce at pre-war prices, less cost to recondition	46,552,200
Original cost	44,910,000
Original cost, less cost to recondition	42,910,000
FIGURES FROM COMMISSION'S BUREAU OF VALUATION REPORT	
Cost to reproduce at present-day prices	$70,723,800
Cost to reproduce at present-day prices, less depreciation	49,788,800
Cost to reproduce at pre-war prices	48,552,200
Cost to reproduce at pre-war prices, less cost to recondition	46,552,200
Original cost	32,580,000

The normal earning power of the system as constituted at present was estimated at $1,200,000 per annum. It was further estimated that with certain suggested changes, requiring no added capital expenditure, the net earnings would be increased to $1,600,000 per annum, and, with an expenditure of $3,000,000 for new cars, to $2,000,000 per annum. The annual fixed charges would be between $967,500 and $1,000,000.

The commission says that the objections raised by Mr. O'Shea, the stockholder, and on behalf of the Columbus & Ninth Avenue bondholders, cannot be considered, as they involve matters not within the power of the commission.

Job E. Hedges, receiver of the railway since March, 1919, handed his resignation of Federal Judge Mayer on July 10 with a request that he be relieved of his duties. Hugh J. Sheeran, his assistant, will be in charge until the receivership is lifted.

The plan of reorganization has been approved by the court.

Kewanee Purchase and Rehabilitation Financed

Spencer Trask & Company, New York, offered for subscription on July 9 at 95 and accrued interest, yielding more than 6.40 per cent, $1,200,000 of first mortgage 6 per cent gold bonds, Series A of the Kewanee Public Service Company, Kewanee, Ill. The proceeds of the issue will be used by the company to take over the properties of the Consolidated Light & Power Company in Kewanee, Neponset, Sheffield and Galva, to take over the municipal plant built by the city of Kewanee and to acquire the street railway and interurban properties.

As explained in the ELECTRIC RAILWAY JOURNAL for June 28, page 1030, the Kewanee Public Service Company will own and operate the electric light and power, gas and street railway business in Kewanee, the gas business in Galva, and will do electric light and power business in Sheffield and Neponset. The company, through its subsidiary, the Kewanee & Galva Railway, will also operate a short interurban line connecting Kewanee and Galva. Among other things the successful consummation of the purchase plan by B. F. Lyons, vice-president and general manager of the Beloit Water, Gas & Electric Company, means the resumption of local railway service in Kewanee, discontinued some months ago, and the rehabilitation of the interurban railway connecting Galva and Kewanee.

The voters of Kewanee on June 14 granted the Kewanee Public Service Company a franchise to operate the electric and gas utilities in Kewanee for a period of twenty-five years. The railway franchise, granted at the same time, extends for a period of twenty years, the longest term obtainable under the Illinois law. The Kewanee & Galva Railway is organized under the Illinois Railroad Law and its franchise extends for a period of fifty years. Other franchise are considered to be satisfactory. The rehabilitated properties will be under the direction of Mr. Lyons.

40,000 Fewer Riders in Toledo in May than in February

A severe drop in patronge brought about a deficit of $32,719 to the fare stabilizing fund of the Community Traction Company, Toledo, at the end of May. Acting Commissioner E. L. Graumlich so reported to the board of control at its recent monthly meeting. As a result a balance of only $41,859 is left in the stabilizing fund. Riding in June showed a still further slump so that it appears likely the fund will soon be practically exhausted. The daily average number of revenue passengers in May was only 148,708. This compared with 182,092 in February.

Service was cut slightly to take care of adjustments in schedules. The industrial slump is said to be largely responsible for most of the decrease although the widespread use of the private automobiles in good weather has contributed to decreased riding. Patronage on the bus lines operated

separately from the railway has also shown a like slump.

A new ordinance applying to main thoroughfares which makes it necessary for automobiles to stop before crossing a street on which there are car tracks has had the effect of reducing accidents in which autos and street cars were involved.

Unfavorable Conditions Reduce Patronage in Winnipeg

The thirty-first annual report of the Winnipeg Electric Railway, Winnipeg, Man., shows that the gross earnings for the year 1923 decreased $114,816 compared with 1922 and that the operating expenses decreased $60,823. The net income for the year was $64,975 less than that of 1922. After the payment of all fixed charges and making the usual provision for depreciation the company showed a net income of $669,360. From this amount there was deducted the dividends paid on preferred stock, amounting to $210,000, and also an additional allowance for depreciation amounting to $156,003. This left $303,348 to be transferred to the surplus account.

According to the report of the president and the directors, one of the most marked features of the year's operation was the contraction in gross earnings which resulted from changed economic conditions and the unusual weather. The temperature averaged much higher than usual, and largely to this fact is attributed a decrease of more than 2,000,000 in the number of people carried on the Winnipeg railway system.

During 1923 the company made substantial additions and improvements to its property. There were two extensions to the track of the railway system and a considerable portion of old track was rehabilitated. The rolling stock was increased by four new buses and a new bus route was opened up in the north end of the city. Considerable work was done also to increase the capacity of the various substations. The accompanying table shows the income account for the year ended Dec. 31, 1923.

INCOME ACCOUNT OF WINNIPEG ELECTRIC RAILWAY
For the Year ended Dec. 31, 1923

Gross earnings from operations		$5,280,407
Operating expenses, before charging depreciation		3,465,892
Net operating revenue		$1,814,515
Miscellaneous income		127,706
Gross income		$1,942,221
Deduct:		
Interest charges on debenture stock and bonds	$663,480	
Extinguishment of discount on securities	16,208	
City percentage and car license	168,192	
Taxes	162,470	
Miscellaneous non-operating expenses	2,975	
Other income deductions	58,496	
		1,071,821
Net income before charging depreciation		$870,400
Deduct:		
Depreciation		201,050
Net income transferred to surplus		$669,350
Surplus brought forward from 1922 as adjusted		$2,301,176
Net income transferred	$669,350	
Dividends on 7% cumulative preferred stock	$210,000	
Additional depreciation	156,002	
	366,002	
		303,347
		$2,604,523
Sinking fund appropriation		55,320
Surplus carried forward		$2,549,203

Twenty-One-Mile Illinois Road Sold

The East St. Louis, Columbia & Waterloo Railway, a 21-mile interurban electric railway connecting St. Louis with Columbia and Waterloo, Ill., has been sold to a St. Louis syndicate headed by Charles H. Lemp, vice-president of the Liberty Central Trust Company. The purchase price is put at $335,000 cash and "other valuable considerations."

The road does both a freight and passenger business. It enters St. Louis at the Eads Bridge through a leasing arrangement with the East St. Louis & Suburban Railway, the tracks of which it uses through East St. Louis and over the Eads Bridge. The road was owned by the Merchants & Manufacturers Investment Company, of which E. H. Conrades is president. The same interests own the stock of Donk Brothers Coal Company and the Troy & Eastern Railway, a steam coal road.

The East St. Louis, Columbia & Waterloo Railway is an Illinois corporation. The new owners are said to have purchased it as an investment.

Committee Reports Iowa Property in Fair Condition

The members of the committee representing the first mortgage bondholders of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., recently inspected the property. E. V. Kane, chairman of the committee, in a circular dated June 15, reported on the conclusions of that trip. He stated that the line was in a fair physical condition with the exception of a 20-mile stretch from Waterloo to Waverly. General business conditions in the territory served were still quiet with a slowly improving tendency.

The current earnings from freight traffic on the Waterloo line reflected the improving trend of general business but the small gain has been overbalanced by the continued decline in passenger traffic due to bus competition and the general use of the automobile. The statement of operations for 1923 versus 1922, showed a balance in 1923 of $29,900 against a balance of $67,029 in 1922. There was an increase in operating expenses also, which according to the report was due largely to the fact that maintenance of the road had been deferred in previous years to be taken care of in 1923. Further, the committee stated that it believed that any substantial improvement in the affairs of the company must come from increased freight revenue.

Again a large amount of accumulative unpaid taxes, inherited from the old management, had imposed a heavy burden upon the company as these obligations were being liquidated in monthly installments out of current earnings.

First mortgage bonds to the par value of $5,114,000 have been deposited with the committee. This amount is approximately 90 per cent of the total issue outstanding.

Detroit Dividend Action Expected July 21

Elliott G. Stephenson, president of the Detroit United Railway, has called a shareholders' meeting for July 21 to authorize the new $10,000,000 bond issue. He has promised that the shareholders' question regarding dividends will be answered then. The Canadian *Financial Post* says that the sinking fund provisions of the new bond issue are such that an accumulation of earnings will have to be built up and this can only be done, it is considered in Toronto, by passing the dividend.

The letter of the president to the shareholders goes into the reasons for the new financing very thoroughly. The sum and substance of it is that the company must relieve the city of Detroit of the mortgage on the interurban lines of the company and this can only be done through the issuance of new bonds covered by notes. At the same time to complete the whole job at once an 8 per cent first mortgage issue is being redeemed, provision is being made for other issues that are falling due, working capital is being enhanced and money is being provided for new extensions. The new financing is being arranged on rather favorable terms, the 6 per cent five-year notes having been offered to the public on a 6.20 per cent basis.

The *Post* says that looking ahead one can see prospects of remarkable improvement in the company's affairs in the next few years, when a great deal of solid strength will have been built into the system by investment of new capital, by reinvestment of capital through sinking fund operations and by retirement of mortgages.

New York Interurban Would Abandon Branch

The Olean, Bradford & Salamanca Railway has petitioned the Public Service Commission for permission to discontinue the operation of its Little Valley division, remove its tracks and dispose of the right-of-way. The branch line runs between Salamanca and Little Valley, the county seat of Cattaraugus County. It is 9 miles in length.

The petition shows that the Little

Valley branch was built by the Western New York & Pennsylvania Traction Company about 1907 and that it has been in continuous operation since. Much loss of patronge has resulted to the division by the construction of a concrete highway between Salamanca and Little River, the petition claims, so that for some years past the line has been operated at a loss. The gross passenger revenue last year was only $9,620, the petition says.

Another reason advanced by the company for desiring to abandon the division is the increasing costs for power. When the line was constructed the Western New York & Pennsylvania Traction Company developed its own power from gas from fields in and around Ceres, N. Y. which the company owned. The production of these fields has dwindled to such an extent that it is not now possible to use gas, and power is purchased. This has added to the cost of operation.

American Electric Power Deal Concluded—New Directors

Nine new directors were elected on June 27 at a reorganization meeting of the American Electric Power Company, Philadelphia. They are: Sidney Z. Mitchell, chairman of the board and president of the Electric Bond & Share Company; George Breed, chairman of the American Gas & Electric Company; George M. Tidd, president of the latter company; Frank B. Ball, vice-president and secretary of the American Gas & Electric Company; F. W. Drager, treasurer of the same company; H. S. Reynold, vice-president of the Appalachian Power Company; C. N. Mason, president of the New River Power Company; C. P. Hamilton, president of the General Electric Securities Corporation, and W. Graham Clayton, chief engineer of the American Electric Power Company.

Six of the former directors who continue upon the board are: Van Horn Ely, Walter H. Lippincott, E. Clarence Miller and Charles L. S. Tingley, Philadelphia; Thomas W. Wilson, Wilmington, Del., and Alexander C. Robinson, Pittsburgh.

Mr. Tidd has been elected first vice-president, succeeding John Gribbel. Mr. Ely remains as president, and other officers also continue under the new ownership.

Approximately 95 per cent of the common stock of the American Electric Power Company was deposited under the offer of the American Gas & Electric Company and the Appalachian Power Company. The Bank of North America & Trust Company has been notified to pay $62.50 for any additional stock, which might be turned in, although the time limit of the offer expired on June 27.

As explained previously in the ELECTRIC RAILWAY JOURNAL, the American Electric Power Company is the successor under reorganization to the American Railways. Included among its railway properties are the Scranton Railway, Altoona & Logan Valley Electric Railway, Chicago & Joliet Electric Railway, Ohio Valley Electric Railway and the Wilmington & Philadelphia Traction Company.

Terms of St. Louis Bus Purchase Opposed

The committee representing the bondholders of the St. Louis Transit Company have declined to accept the terms of John Hertz, Chicago, of $2,400,000 for the local St. Louis bus lines. Members of the committee representing the bondholders of that company are said to have taken the position that the purchase of the property, which is being operated solely on a permit from the Board of Public Service, is too hazardous and that the price asked is too high. However, it is stated that the decision of the committee is not irrevocable and the hope is still entertained that the sale may be perfected.

Failure of the reorganization committee of the United Railways to reach an understanding with the suburban bondholders is said to have affected the decision of the Transit committee on the bus line purchase. J. K. Newman, a member of the reorganization committee, had proposed that the holders of the $6,500,000 of Suburban bonds outstanding accept $2,000,000 cash and $4,500,000 in securities of the reorganized company for their holdings. The Suburban holders have been inclined to insist on payment in full or the return of the Suburban properties.

Three Portsmouth Lines Abandoned

The Virginia Corporation Commission has authorized the Virginia Railway & Power Company to abandon three of its lines in Portsmouth. The company had operated the lines at a loss for some time, but it did not act to discontinue them until after the city had granted jitney lines the right to compete with the traction system. The attempt will be made to serve the people of Portsmouth in the abandoned territory by rerouting the jitney lines.

Byllesby Makes Offer for California Railway & Power Stock

H. M. Byllesby & Company, Chicago, Ill., have made an offer of $65 a share for the prior preference stock of the California Railway & Power Company, which owns all the capital stock, except directors' qualifying shares, of the Sierra & San Francisco Power Company.

As just indicated, the California Railway & Power Company is a holding company. It is controlled through stock ownership by the United Railways Investment Company. Its authorized capital stock includes $5,000,000 prior preference stock, of which $2,300,000 is now outstanding. By securing a certain amount of this prior preference stock, Byllesby & Company, it is understood, will be in a position to complete purchase plans for the Sierra & San Francisco Power Company. The latter company, which has $20,000,000 capital stock and $20,000,000 funded debt, is at present leased to the Pacific Gas & Electric Company. The California Railway & Power Company also owns certain equity shares of the Market Street Railway, San Francisco.

It is the opinion of Byllesby & Company that the Sierra & San Francisco Power Company may be operated profitably if combined with properties adjacent to it, such as, for instance, certain Byllesby properties. In this connection they say they are interested in purchasing a certain number of shares of the prior preference stock in order eventually to obtain a controlling interest in the Sierra & San Francisco Power Company.

Railway in Astoria, Ore., Abandons Service

Buses replaced the electric cars in Astoria, Ore., on June 29 and now afford the only means of public transportation in that city. The railway system, which has been in operation more than forty years, under the direction of the Pacific Power & Light Company, ceased functioning on that date. A fleet of twenty-five-passenger Mack buses is now in use there, operated by the Astoria Transit Company.

As long ago as last December it was indicated that the railway at Astoria would probably be abandoned. The system is one of a little more than 5 miles. A year and a half ago an area of thirty-five city blocks was wiped out by fire and the railway and the power and light lines of the company were damaged to the extent of about $175,000. More than fourteen blocks of railway track was destroyed. It had been estimated that the work of rehabilitating the railway would cost $150,000. As the railway was a losing proposition the company notified the local City Commission of its intention of abandoning operation.

Bills Owed to Municipalities Paid in Full by Kansas City Railways

The Kansas City Railways paid in full on July 2 all the bills and claims of Kansas City, Mo., and Kansas City, Kan., against it. The Missouri city received $141,950 and the one on the Kansas side $29,000. This indebtedness was incurred by the company before it passed into the hands of receivers on Sept. 9, 1920.

Kansas City, Mo., formerly claimed a total of $175,850, but an agreed reduction in the inter-city viaduct rental and counter claims for street repairs put in by the railway brought the amount down. The amount finally agreed upon was $22,000 larger than that offered by the company early this year to the retiring city administration.

Bankers Offer Illinois Power & Light Preferred

Blyth, Witter & Company, New York, N. Y., offered for subscription on July 10 at $95 a share plus accrued dividend, yielding 7.37 per cent, $5,000,000 of 7 per cent cumulative preferred stock of the Illinois Power & Light Corporation, Chicago. It was explained that $2,600,000 of the issue had been placed privately. The Illinois Power & Light Corporation owns and operates or controls electric power and light, gas, heat and city railway properties in a large number of the most populous and prosperous munici-

palities in Illinois. The corporation also controls, through ownership of the entire capital stock, Illinois Traction, Inc., which owns an extensive and profitable system of trunk line electric railroads in Illinois, and other utilities of which the most important are the Des Moines & Central Iowa Electric Company and the Kansas Public Service Company.

Property at El Paso, Tex., Expands.—The El Paso Electric Railway has purchased the plant of the Las Cruces Electric Light & Ice Company. The purchase price of the plant, including the cost of installations to be made, is said to total $275,000. The El Paso Electric Railway does both a railway and lighting business. Control of the company is vested in the El Paso Electric Company. Stone & Webster, Inc., are executive managers.

Atlanta Company Does More Financing.—Authority to issue $3,000,000 of thirty-year 6 per cent general mortgage gold bonds, maturing April 1, 1954, has been asked of the Georgia Public Service Commission by the Georgia Railway & Power Company, Atlanta. The proceeds are to be used for development of water power facilities in the vicinity of Tugalo, Tallulah and Burton dams, where the company has for years been carrying forward its program of hydro-electric development. On July 1 Estabrook & Company, New York, and Putnam & Company, Hartford, Conn., offered for subscription at 95, yielding 7.37 per cent, $2,500,000 of 7 per cent cumulative first preferred stock of the company series of 1924.

Wants to Purchase Line.—The Indiana Service Corporation, Fort Wayne, Ind., has filed a petition with the Public Service Commission asking for authority to purchase 95 per cent of the capital stock of the Ft. Wayne & Northwestern Railway. The property, which it is proposed to purchase, includes a traction line from Ft. Wayne to Garrett and Kendallville, Ind. The petition said the purchase price for the capital stock would be $448,000.

Petition for Permission for Abandonment Dismissed.—Justice Joseph Aspinall of the Supreme Court, sitting in Brooklyn, has dismissed the motion made by counsel for General Lincoln C. Andrews, receiver for the New York & Queens County Railway, for permission to abandon the lines and forfeit their franchises. The court ruled, however, that this dismissal does not prejudice a later presentation of the motion, if conditions should warrant such a course. It appeared during the hearing that the receiver desires to keep the motion open, so that it may again be presented if the City of New York should in any way compel a reduction of the 6-cent fare now being collected on the lines of the company under an order from the New York Transit Commission.

Line Goes Out of Business.—A recent court decree terminated the operation of the Sunbury, Lewisburg & Milton Electric Railway, Sunbury, Pa. The company was organized thirteen years ago, but only 1½ miles of the track was built. This line was used principally by shopmen of the Pennsylvania Railroad.

Interurban Would Abandon Short Line.—Application has been made to the Maryland Public Service Commission, Baltimore, by the Washington Interurban Railroad, controlled by the Washington Railway & Electric Company, for permission to abandon 1.57 miles of rail service between Bladensburg and East Riverdale, Md., until a new highway is completed between these points. Upon completion of the highway the company wants to substitute bus service. The commission will hold a hearing on the subject on July 23.

Receivership May Be Lifted in August.—Under the plans for its reorganization two separate companies will take over the properties of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., which has been operated by a receiver for several years. As a first step in the reorganization the Buffalo & Erie Railway has been incorporated to operate in Erie and Chautauqua Counties with headquarters at Erie, Pa. It will take over the interurban division between Erie, Pa., and Buffalo, N. Y., while the Erie Railway will take over and operate the local lines in the city of Erie, Pa. It is expected that the receivership will be lifted early in August. As noted in the ELECTRIC RAILWAY JOURNAL for July 5, page 33, the capital stock of the Buffalo & Erie Railway consists of 7,005 shares of preferred at $100 per share and 30,000 shares of common stock of no par value.

Receiver for Massachusetts Road.—The Milford, Attleboro & Woonsocket Street Railway, Milford, Mass., has been placed in the hands of Clark V. Wood, president of the company, as receiver, by Judge Wait in the Massachusetts Supreme Court. The company has a stock liability of $315,000, all to the New England Investment & Securities Company. It has paid no dividend since 1914. It has a floating indebtedness of $59,198. Mr. Wood has been instructed by the court to prepare an inventory of the property within sixty days. About 30 miles of track are operated by the company. The road connects Woonsocket, R. I., with Blackstone, Milford, Franklin, Plainville, Bellingham, Hopedale, Mendon and Wrentham in Massachusetts.

Reduction in Capital Stock Authorized.—The Lafayette Street Railway, Inc., Lafayette, Ind., has petitioned the Indiana Public Service Commission for authority to reduce its authorized capital stock from $200,000 to $100,000. At present only $80,000 of the authorized capital has been issued.

Book Reviews

Principles of Railway Transportation

By Eliot Jones, Ph.D., professor of economics, Leland Stanford University. 607 pages. Published by the Macmillan Company, New York, 1924.

While this book is designed primarily to serve the needs of teachers of elementary railroad transportation, it is stated that it is a reference book that will appeal to the general reader who desires an unbiased understanding of the fundamentals of the railroad situation. A great deal of the book is taken up with railroad history. Not only does this include the early history of the railroads, but a history of legislation prior to the World War, a very complete chronicle of events during the war, and the principal developments since that time, including a discussion of the operation of the Esch-Cummins act of 1920.

Arc Welding Handbook

By C. J. Holslag, Chief Engineer, Electric Arc Cutting & Welding Company. Published by the McGraw-Hill Book Company, Inc. New York, N. Y. 1924. $2.

This book provides a simple and practical manual of instruction in arc welding. The various methods and equipment in general use are described and the individual processes are taken up step by step in a simple manner so that the beginner can understand both the equipment and the welding process. A number of questions are asked at the end of each chapter for assistance in case the book is used as a text.

Chapters, are given on various details of welding, such as bead forming, spread welding, padding, lap, butt, tank and boiler welding. The book also contains recommendations for setting up the equipment of various types of electric welding apparatus and descriptions of useful welding methods. Information is included for men in a supervisory capacity, so that the owner, manager, foreman and others may have specific information in regard to their welding problems.

New York, New Haven & Hartford Railroad Electrification

Published by Westinghouse Electric & Manufacturing Company with the co-operation of officers of the New York, New Haven & Hartford Railroad, June, 1924. 43 pages, 8½x11.

This attractively arranged booklet contains a description of the electrification of the New Haven Railroad between Grand Central Terminal in New York and the Cedar Hill freight terminal east of New Haven. In addition there is a brief account of the minor electrical installations of the railroad, the first of which, the Nantasket Beach branch, dates back to 1895. This is stated to be the first example of electric power applied to steam railroad operation in this country.

The book includes technical descriptions of the track and overhead system, power generation and distribution, the signal system, locomotives and multiple-unit cars, equipment maintenance practices and facilities, service and results of operation. This electrification, it is stated, has 590 track-miles supplied by the 11,000-volt, single-phase overhead trolley system and includes the largest electrified yard in the world. The equipment includes the most extensive single homogeneous signal system in the world. The book is an excellent record of recent progress.

Personal Items

Ross Schram in Charge

Former Assistant General Manager at Detroit Placed in Full Charge of 400-Mile Municipal System

Much of the success that has attended the operation of the municipal railway in Detroit is attributed by the Street Railway Commission to the vigor and enthusiasm of Ross Schram, who has just succeeded William B. Mayo as general manager of the Detroit Department of Street Railways. Mr. Schram's first activity in public life in Detroit dates from the time he was named as secretary to Mayor-elect James Couzens in 1918, just preceding the controversy between the Mayor and the Detroit United Railway. When the start was made in 1919, on the construction of the first of the municipal lines as the nucleus of Detroit's present system, Mr. Schram was made secretary of the Street Railway Commission. The duties of that position he performed in addition to being the Mayor's secretary.

Mayor's Policies Carried Out

Mr. Schram was familiar with the policies of Mr. Couzens and knew the program the former Mayor had mapped out, and when he was named assistant general manager of the D. S. R. on Dec. 23, 1921, as aid to the late Joseph S. Goodwin, then general manager, Mr. Schram became still more active in street railway affairs. Mr. Goodwin concerned himself largely with the details of practical street railway operation while Mr. Schram was instrumental in carrying out the Couzens policies when the railway system expanded to a point where the former Mayor could not devote the necessary time to street railway affairs.

Upon the death of Mr. Goodwin, Mr. Mayo resigned his place on the Street Railway Commission to become general manager of the railway and Mr. Schram continued as assistant general manager. Mr. Mayo has many outside interests, notably with the Ford company, and it was his idea that Mr. Schram should be put in charge as general manager as Mr. Schram had really been acting as chief executive but without the full credit and responsibility and without the pay of the position.

It has often been said that the occasion produces the man. This has certainly been true in the Detroit case. In a way Mr. Schram was hurtled into one responsibility after another at Detroit. The advisability or inadvisability of municipal ownership entirely aside from the question, Mr. Schram's record of accomplishments appears destined to stand the test of time. And after all is said and done there lies the criterion of greatness. Mr. Mayo's own recommendation of Mr. Schram is in itself a glowing tribute to the ability of the new manager, for Mr. Mayo, a man of great talent and wide experience, in the best possible position of all to judge the matter, has said in effect that Mr. Schram's record entitled him to full credit and full responsibility.

It is well to consider just what that means. It means the direction of 378 miles of city railway with nearly 1,500 cars, a big responsibility for a man only thirty-six years old. It is also well to consider the past. Since the city took over the local lines they have been largely rebuilt physically. Some of the other accomplishments include the addition of more than 500 cars, representing an increase in rolling stock of approximately 45 per cent, and the construction of nearly 50 miles of new line. Operating first on a 5-cent fare and later on a 6-cent fare, the municipal system has maintained itself and met all payments on the Detroit United Railway purchase price, approximately 25 per cent of which is now paid off. It is true that Mr. Schram has been aided in the work at Detroit by some of the best engineering and management talent in the country, but, after all, the credit of accomplishment is largely his.

Ross Schram

Mr. Schram was born in Battle Creek, Mich., in September, 1888. He became connected with Detroit affairs as municipal representative for the Detroit *News*. This was after his graduation from the Detroit University School. Later he entered the automobile field and was connected with the Charles H. Fuller Company, advertising agents, Chicago, handling the Overland, and with the J. Walter Thompson Company, New York, handling the Ford account. He was also associated with the Packard Motor Car Company as editor of the Packard house organ. For two years he was an automobile dealer in Ottawa, Ont.

Chicago Surface Lines Promotions Announced

Recent changes in personnel announced by the Chicago Surface Lines are as follows:

F. L. Kriete promoted to general attorney. He will also have charge of the department of accident investigation. Mr. Kriete succeeds John R. Guilliams, recently appointed general counsel in charge of the legal department of the company.

E. H. Altemeier promoted from assistant division superintendent to division superintendent in charge of second division.

Floyd J. Frank promoted to assistant division superintendent in charge of fifth division.

E. L. Brookman promoted to assistant division superintendent in charge of tenth division.

George T. Connor has been named general superintendent of the Moose Jaw Electric Railway, Moose Jaw, Sask., succeeding the former general superintendent, H. A. McLean. Mr. Connor has resided at Moose Jaw since August, 1911. He was born in Hillsborough, N. B., in February, 1891, and served his apprenticeship in engineering with the Portland Iron & Steel Company, Portland, Me. In 1911 he assisted in laying the bedplate of the first power unit of the Moose Jaw company's power plant and for nine years was in charge of this plant, a pioneer Diesel installation in the West. Since the railway's own plant was shut down and the railway has been purchasing power from the city power plant, Mr. Connor has acted for the company in the capacity of assistant to the superintendent.

Daniel F. Lewis's name was omitted as one of the past presidents of the New York Electric Railway Association in the report of the annual convention of that body in the issue of June 28. This was an oversight. In the report of the meeting the statement was made that the newly elected president of the association, C. E. Morgan of the Brooklyn City Railroad, was the first officer of that company to be elected president since 1882. As a matter of fact, Daniel F. Lewis was elected president of the association in 1890-91, when he was president of the Brooklyn City Railroad.

F. C. Chambers, president and general manager of the Des Moines City Railway, Des Moines, Iowa, was re-elected president of the Iowa Electric Railway Association at the annual meeting at Fort Dodge, on June 24 and 25. A portrait and a biography of Mr. Chambers were published in the ELECTRIC RAILWAY JOURNAL for June 21, 1923, on the occasion of his election to head the association.

F. A. Persons has been appointed superintendent of the Greenfield-Turners Falls, Mass., line, which has been taken over by the towns of Greenfield and Montague for operation under the state transportation area act. Early in his career he was in the employ of the Concord, Maynard & Hudson Street Railway, serving in the mechanical, accounting and operating departments. He was made superintendent in 1909. Prior to that he was connected with the Connecticut Valley Street Railway, Greenfield, Mass. In the fall of 1913 Mr. Persons was appointed to the position of superintendent of motive power and equipment of the Massachusetts Consolidated Railways, Greenfield.

Obituary

Benjamin G. Lamme

Benjamin G. Lamme, chief engineer of the Westinghouse Electric & Manufacturing Company and one of the pioneers in developing methods of high tension transmission, died on July 8 at his home at East Liberty, Pa., at the age of 60 years.

Many tributes have been paid to Mr. Lamme, but his characteristics and accomplishments have, perhaps, been most succinctly stated by one of his associates who said in effect that Mr. Lamme was one of the silent leaders of the engineering industry, a man whose genius was expressed in creative effort, whose vision covered a range beyond immediate problems, and whose work is a monument to their memory. Mr. Lamme typified during his life not only the spirit of research and experiment but the spirit of practical achievement.

Mr. Lamme was a prolific inventor, 150 patents standing to his credit. He was largely instrumental in the perfection of many alternating-current devices. Numbered among his early achievements was the design of the famous 5,000-hp. "umbrella-type" generators for use at Niagara Falls. He also designed the generating and motor equipment for the New York, New Haven & Hartford Railroad, following this by electrification work on the Paoli section of the Pennsylvania Railroad and on the Norfolk & Western Railroad. His work on the synchronous converter he regarded as one of his greatest achievements. For years he fought the battle for it almost single-handed. He won out, and this is now the accepted machinery for converting alternating current into direct current.

Mr. Lamme had long held the belief that the success of heavy electric railroading lay in the use of a high-voltage alternating current on a single overhead trolley. The main difficulty lay in finding suitable ways and means for utilizing the single-phase alternating current. After several attempts he succeeded in designing a series commutator type of motor with suitable characteristics, which he described along with the system of power distribution in a famous paper before the American Institute of Electrical Engineers.

Following his graduation from Ohio State University Mr. Lamme entered the employ of the Westinghouse Company in 1889 at $30 a month. Although he had little opportunity to study electricity in college, there being no course in electrical engineering at that time, he became deeply interested in the subject and read all he possibly could about it. Owing to his skill in mathematics he was assigned by the Westinghouse company to the task of studying the natural laws to which electrical phenomena were subject and of finding methods for the calculation of electrical machines in accordance with those laws.

An outstanding trait in Mr. Lamme's character was his interest in young engineering students. For years he made a study of the young technical graduates who entered the Westinghouse Electric organization, analyzing their abilities and characteristics to adapt them to the work to which they were best fitted. He maintained a design school for these men, in which he gave actual instructions, so that today the methods and knowledge of this great engineer have been passed on to the vast Westinghouse engineering body, and will stand as an inheritance to these engineers in years to come.

His tastes were simple and his modesty extreme. He had no flair for publicity and his name was not familiar to the man in the street, but his impress on the plastic industry with whose phenomenal growth his mature life was coeval, was deep and will be lasting.

Mr. Lamme was born on a farm near Springfield, Ohio, on Jan. 12, 1864. He entered Ohio State University in 1883, and was graduated in mechanical engineering in 1888, having been out of school for one year because of his father's death.

B. G. Lamme

Mr. Lamme was a fellow of the American Institute of Electrical Engineers. From the Institute he received the honor of being elected one of the two members from that body on the Naval Consulting Board during the war, and he was also made chairman of the inventions committee on that board. In 1919 he received the Edison medal from the Institute for his engineering achievements. Last year the board of trustees of Ohio State University awarded him the Joseph Sullivant medal in recognition of the value of his work to the world.

Hiram B. Stubblefield

Hiram B. Stubblefield, purchasing agent for the Nashville Railway & Light Company, Nashville, Tenn., died in that city on July 6.

Mr. Stubblefield entered the street railway field in Nashville when the first horse-drawn cars made their appearance. He was then connected with a company operating the Woodland Street line and was so employed when the Broad Street line, the first to be electrified, did away with its horse-drawn vehicles.

With electrification of the roads came consolidation, and Mr. Stubblefield was elected secretary and treasurer of the McGavock & Mount Vernon Railroad, a consolidation. During the '90s, the McGavock & Mount Vernon and a small company operating in South Nashville were bought out by the United Electric Company.

Mr. Stubblefield left the railway business after the purchase and bought, with his brother, a ferry landing in Perry County. Five years later they sold out and bought some phosphate beds in Hickman County, which they continued to operate until ten years ago, when Mr. Stubblefield accepted the position as purchasing agent for the Nashville Railway & Light Company.

Mr. Stubblefield was born at McMinnville, Tenn., on Oct. 6, 1853, and was graduated from Hughes and Mims preparatory school and later received a B. A. degree from Emory and Henry College, Virginia.

C. N. Wilcoxon

C. N. Wilcoxon, former president of the Chicago, Lake Shore & South Bend Railway, South Bend, Ind., died suddenly by his own hand in his home at Michigan City, Ind., on July 7. It has been known that Mr. Wilcoxon was ill for some time and this illness is thought to have caused a depression, which ended in dementia.

Mr. Wilcoxon was born at Muncie, Ind. The early part of his business career was spent in the construction and management of gas and waterworks systems. In 1893 he accepted the position of general manager of the local street car lines at Muncie, Ind., where he remained until 1898, when he went to Decatur, Ill., as general manager of the Decatur Traction Company. During his association with this property the system was rebuilt and put on a substantial, paying basis. In 1901 Mr. Wilcoxon became general superintendent in charge of the operating department of the Western Ohio Railway, Lima, Ohio, where he remained until 1905, when he became general manager of the Cleveland, Southwestern & Columbus Railway. It was while acting in this capacity that he began to urge the various methods for promoting safety which today have become so important a part of transportation practice. Mr. Wilcoxon may be said to be one of the pioneers in the modern safety movement.

In 1909 he resigned his position with the Cleveland, Southwestern & Columbus to become general manager of the Chicago, Lake Shore & South Bend Railway. In 1914 he was also elected a vice-president of the latter company and later in the same year became president. This position he retained until April, 1924, when he resigned on account of ill health.

Mr. Wilcoxon served as president of the Central Electric Railway Association in 1917.

William Piper, for the last twenty years assistant superintendent of the Niagara Gorge Railway, Niagara Falls, N. Y., died on July 5 at his home in Lewiston, N. Y. He was 54 years old. Mr. Piper had been associated with the Niagara Gorge Railway since its organization in 1895. He is survived by his wife, a daughter and two sons.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

American Car & Foundry Earnings Increase

The net earnings of the American Car & Foundry Company, Berwick, Pa., for the year ended April 30, 1924, were $6,304,000, compared with $6,213,000 in the previous year. These earnings, which resulted from the subtraction of charges, Federal taxes and preferred dividends, are equal to $14.01 a share on the $30,000,000 of common stock compared with $13.71 a share a year ago.

	1924	1923
*Profit	$10,786,573	$10,633,562
Renewals, replacements	4,481,606	4,419,951
Net income	$6,304,967	$6,213,611
Preferred dividends	2,100,000	2,100,000
Common dividends	3,600,000	3,600,000
Surplus	$604,967	$513,611
Previous surplus	36,673,499	36,159,888
Total surplus	$37,278,466	$36,673,499

*After federal taxes.

W. H. Woodin, president of the company, said that operations were now between 75 and 80 per cent of capacity and that although buying of equipment had decreased, he anticipated satisfactory conditions when the crops had their analysis.

Barney & Smith Plant Sold Piecemeal

The piecemeal sale of the Barney & Smith Car Company's plant at Dayton, Ohio, has been approved by Judge Edward T. Snediker of the Montgomery County Common Pleas Court. The assets of the company were sold at public auction on June 12 by Master Commissioner Carroll Sprigg. The amount obtained in the sale was approximately $437,306. The court's approval virtually ends protracted litigation. The purchasers assume June taxes and assessments amounting to $38,951, making a sale value of $476,257.

The sale was held following a nation-wide advertising and circularizing campaign. It was in charge of the Gerth Realty Experts, New York, auctioneers, and D. G. Boyd, Dayton, realtor. It was attended by machinery buyers from many sections of the country. The plan to parcel the real estate was conceived by the realtor in charge of the sale, after it became apparent that no manufacturers could be interested in the plant as a whole. The sale was considered a success because of the industrial outlook and the fact that all parcels were bid in at good market prices.

This was the fifth attempt to dispose of the holdings at the instigation of the receiver, Valentine Winters, Dayton banker. The sale was ordered by the court following foreclosure action in behalf of holders of the first mortgage bonds.

The plant comprises forty-seven acres of land and seventy-six buildings of various sizes. Most of them are said to be in a neglected condition. The plant has been idle for six years and it has been considered to be obsolete as a car-building establishment.

Spray Engineering Sales Organization Strengthened

The Spray Engineering Company, Boston, Mass., has appointed H. Clay Moore southeastern representative, with headquarters in the Healy Building, Atlanta, Ga. His territory will include Georgia, Alabama and Florida. L. H. Parker, president of the Spray company, also announces that a distributing sales organization to handle the pneumatic spraying apparatus of this concern has been formed at Boston under the name of the Spray Painting & Finishing Equipment Sales Company. Headquarters are at 60 High Street. F. H. Hills has been elected president of this subsidiary.

New Cars in Service in Knoxville

Fourteen new cars were placed in service on June 1 by the Knoxville Power & Light Company, Knoxville, Tenn., seven being of the double-truck type shown in the accompanying illustration, and the other seven being single-truck safety cars. The total cost of these cars, which were built by the Cincinnati Car Company, was about $134,000.

Type of Car Recently Placed in Operation in Knoxville, Tenn

New Railway Publications Issued By Westinghouse

The Westinghouse Electric & Manufacturing Company has released several new publications on steam railroad electrification, railway equipment, operating data, electric railway motors and controllers and also a leaflet on freight haulage.

Reprint 176, "Baldwin-Westinghouse Electric Locomotives," is a thirty-two-page publication covering the use of these locomotives for main line service.

Folder 4596, "An Exhibit of Modern Steam and Electric Equipment," consists of illustrations and certain pertinent data relating to the exhibit at the A. I. E. E. convention in Philadelphia, Feb. 4-8.

Folder 4587, "Suburban Transportation by Electricity," gives a summary of the equipment, distribution system and operating data of the Philadelphia-Paoli electrification of the Pennsylvania Railroad.

Eight new pages of operating data on railway maintenance are entitled:

"Assembly and Care of Jumpers and Receptacles."
"What Baking and Dipping Armatures Did for One Operator."
"The Maintenance of Electric Railway Car Wheels."
"Lightning Arresters and Their Application for Railway Equipment Protection."
"Special Armature Bearings to Fit Worn Shafts."
"Protecting Railway Motor Commutators at Front V-Ring."
"Shop Methods of Cleaning Detail Parts of Car Equipment."
"Wrenches and Hand Tools for Overhauling Railway Motors."
"Selection of Waste for Railway Motor Bearings."
"How to Reduce Temperature on Overload Motors."

Leaflet 20,153, "Type K-35 Controller," has also been released. This gives detailed specifications and dimensions of the K-35 KK standard railway controller and a diagram of connections for two controllers and four motors.

Leaflets 20,055-A and 20,148 cover specifications on the 535-A and 514-A railway motors respectively.

"Freight Haulage," Leaflet 20,174, sets forth briefly the benefits to be derived from the establishment of freight service on interurban lines.

In Leaflet 20,154, "External Fans for Non-Ventilated Railway Motors," is described the latest scheme developed for the improvement of the earlier types of non-ventilated railway motors.

Metal, Coal and Material Prices

Metals—New York	July 8, 1924
Copper, electrolytic, cents per lb.	12.375
Copper wire base, cents per lb.	14.75
Lead, cents per lb.	7.00
Zinc, cents per lb.	6.15
Tin, Straits, cents per lb.	44.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	2.15
Pittsburgh mine run, Pittsburgh, net tons	1.875
Franklin, Ill., screenings, Chicago, net tons	1.70
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$6.00
Weatherproof wire base, N. Y., cents per lb.	17.00
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal.	$0.99
White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots	11.625
Turpentine (bbl. lots), N. Y., per gal.	$0.83

Rolling Stock

Long Island Electric Railway, Jamaica, N. Y., on July 7 suffered the loss of its carhouse at Jamaica and thirty cars in a fire which practically destroyed the plant. The equipment burned included eleven double-truck open cars, fifteen double-truck closed cars and four work cars. The total damage is estimated at $100,000, $15,000 of which represents the loss of the building. Service was continued with the remaining rolling stock and with cars borrowed from other properties. It has not yet been decided by the management just what will be done to secure equipment to replace that destroyed.

Richmond Light & Railroad Company, Staten Island, N. Y., has made available for publication the details regarding the twenty-five one-man two-man cars ordered from the Osgood-Bradley Car Company. The principal specifications are as follows:

Number of cars ordered	25
Name of road,	Richmond Light & Railroad Company
Date order was placed	Feb. 15, 1924
Date of delivery	Complete July 15, 1924
Builder of car body,	Osgood-Bradley Car Company
Type	Light-weight, double-truck one-man, two-man safety car
Seating capacity	44
Total weight	33,800 lb.
Bolster centers, length	21 ft. 4½ in.
Length over all	44 ft.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 4½ in.
Height, rail to trolley base	11 ft. 1½ in
Body, steel.	
Interior trim	Steel, stained cherry color
Roof	Arch
Air brakes,	Westinghouse, with DH-16 compressor
Armature bearings	Plain
Axles	A.E.R.A. standard
Bumpers	Channel anti-climber
Car signal system	Push button
Car trimmings	Bronze
Center and side bearings	Plain
Control	GE Type K with line switch
Curtain fixtures	Morton Mfg. Co.'s crown
Curtain material	Fabrikoid
Destination signs,	Hunter No. 8 illuminated
Door-operating mechanism,	National safety car equipment
Wheelguards	Root
Gears and pinions	General Electric
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Ohio Brass, golden ray
Journal bearings	Plain
Journal boxes	Symington
Lightning arresters	General Electric
Motor	Four G.E.-265, inside hung
Registers	Sterling-Meaker
Sanders	Ohio Brass, air type
Sash fixtures	Howard
Seats	Heywood-Wakefield 57-SK
Seating material	Rattan
Step treads	Kass Safety
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	General Electric
Trucks	Osgood-Bradley No. 30-66
Ventilators	Eight single exhaust type
Wheels	Cast iron, 26 in.
Special devices,	Air-operated gong and register ringing device.

Interurban Expects to Begin Bus Service Soon.—The Interstate Public Service Company, Indianapolis, expects to begin operation about Aug. 1 of twelve de luxe type buses on a 20-mile run from Indianapolis to Greenwood, Whiteland and Franklin, Ind. This service, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL, will parallel the interurban line and will take the place largely of the present local service over the interurban. The highway between Indianapolis and Franklin is paved all the way. This is the first bus operation entered into by the Interstate Public Service Company as such, though it has previously entered in a joint arrangement with independent bus operators.

Track and Line

Kansas City Railways, Kansas City, Mo., is putting in a street railway loop at Muehlbach Field for the benefit of the baseball fans. The cost of the work is $40,000. Of this amount the laying of the tracks cost $37,270. The rest of the amount is spent for property rights.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will soon begin building an extension on Center Street from Twenty-seventh Street to Thirty-fifth Street, connecting its Thirty-fifth and Twenty-seventh Streets one-man car lines. A franchise for this extension was recently granted by the Common Council.

Louisville Railway, Louisville, Ky., placed in operation on July 4 a new loop at the entrance to the Louisville Baseball Park of the American Association Club, which has a seating capacity of more than 20,000 people. The company carried a connecting line from Fourth Street through Avery Street to Second Street in order to run cars out Fourth Street headed for the ball park.

Pacific Electric Railway, Los Angeles, Cal., has started construction work on a double track tunnel to be 4,225 ft. long. The new tunnel will provide a more direct route for the Pacific Electric Railway cars from the business district of Los Angeles to Hollywood. The total cost of the project is to be about $3,500,000. Contract for driving the tunnel has been awarded to Twohy Brothers.

Power Houses, Shops and Buildings

Wilmington & Philadelphia Traction Company, Wilmington, Del., suffered damage to its property in a storm on June 25, amounting to approximately $40,000. An old carhouse at Sixth and Hawley Streets, housing forty cars, was demolished. The carhouse, formerly owned by the old Peoples Railway Line, stood next to the new carhouse. It is estimated that it will cost $30,000 to replace.

Pacific Electric Railway, Los Angeles, Cal., announces that due to the large increase in volume of freight and passenger traffic on its southern division lines, it proposes the construction of another automatic substation in the city of Los Angeles, near Twenty-fifth Street and Long Beach Avenue on its Long Beach four-track line. The new substation complete will cost approximately $104,000. Construction of the new station will begin soon. Upon completion of the new substation it will bring the total of the Pacific Electric power transforming stations in Southern California to fifty-three.

Trade Notes

Fort Pitt Spring & Manufacturing Company, Pittsburgh, Pa., is in no way connected with the Mitchell Spring Works, Johnstown, Pa., reported recently to have passed to a new company, known as the Mitchell Spring & Manufacturing Company. William McBride, president of the Fort Pitt Company, denies that he is a stockholder in the Mitchell Spring Works or its successor or that any members of the Fort Pitt company are interested in the Mitchell enterprise.

Portland Cement Association, Chicago, Ill., announces the appointment of L. N. Whitcraft as district engineer in charge of the Philadelphia office, 1315 Walnut Street, effective June 1. Mr. Whitcraft has been connected with the Portland Cement Association for eight years as field engineer attached to the New York office. For several years past he has been in charge of association work in New Jersey. Prior to joining the Portland Cement Association staff, he was county road engineer for Somerset County, Maryland, and chief engineer of the hydrated lime bureau of the National Lime Manufacturers' Association.

General Electric Company, Schenectady, N. Y., has announced that K. A. Hills, since January attached to the Davenport sales office of the General Electric Company, has been made manager of that office, covering a territory including a large part of the state of Iowa. Mr. Hills has been an employee of the General Electric Company since May, 1910. S. F. Gates, for fourteen years in charge of the Spokane office, has been appointed manager of the Los Angeles office. Bernhard Olsen, for twelve years employed in the Spokane office, has been appointed manager of that office, succeeding Mr. Gates.

Nic Le Grand, Inc., Rock Island, Ill., has received an order for seven positive safety equipments for the Toledo & Indiana Railroad. These are to go on new cars being built by the Cincinnati Car Company. The Le Grand Company has also received an order for its safety equipment for converted cars for the Wisconsin Public Service Corporation at Green Bay, Wis.

New Advertising Literature

Oxweld Acetylene Company, Long Island City, Chicago and San Francisco, has published a new forty-eight-page catalog illustrating and describing its extensive line of acetylene generators and oxyacetylene welding, cutting, brazing, lead burning, heating and decarbonizing equipment. The book is replete with information useful to the user or prospective user of oxyacetylene apparatus.

Foamite-Childs Corporation, Utica, N. Y., has issued a twenty-page booklet called "Dipping Dangers." The booklet describes among other things the application of Foamite protection to modern industrial fire hazards.